32nd
Annual Review of Industry Progress

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EBRUARY 954

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TWIN COACH

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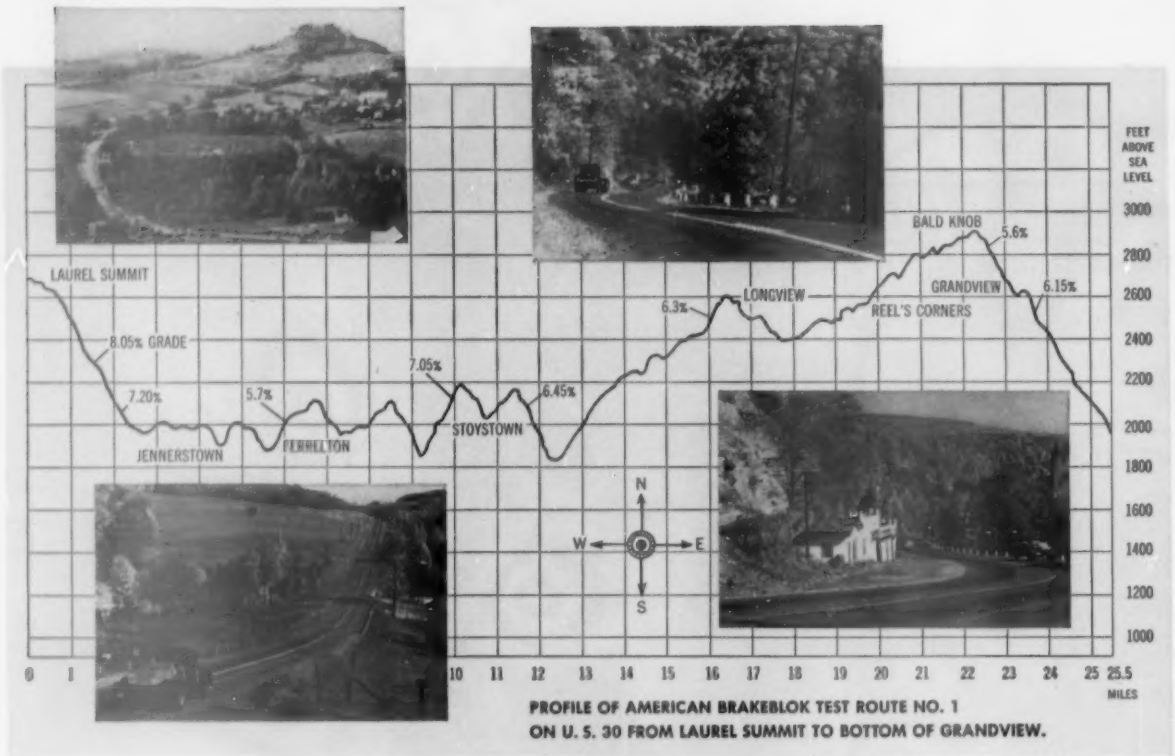

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. . . to develop the best brake lining for you

American Brakeblok Test Trucks follow this course daily. Under all conditions of load the lining is put through every possible test—performance, fade, recovery, moisture sensitivity, wear, glaze, and maximum heat resistance. Accurate instrumentation records test data for interpretation by our research staff.

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(With which is consolidated Bus Age)

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BUS TRANSPORTATION

FEBRUARY • 1954

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Next Month . . .

Watch for a new revenue-producing idea for trolley bus operators. The March issue will carry the details on Indianapolis Railways' progressive method of operating express schedules on four of its trolley bus routes. Another important feature will cover the comprehensive public relations program of Virginia Transit.

An Open and Shut Case!

IN CHICAGO

The last 300 of 400 Propane buses ordered by the Chicago Transit Authority in 1953 are being equipped with

Consolidated Door Operating Equipment

Here's why

In line with the CTA program of setting high standards of mass transportation, these buses will have **Consolidated Push Door Units** with accelerator interlock.

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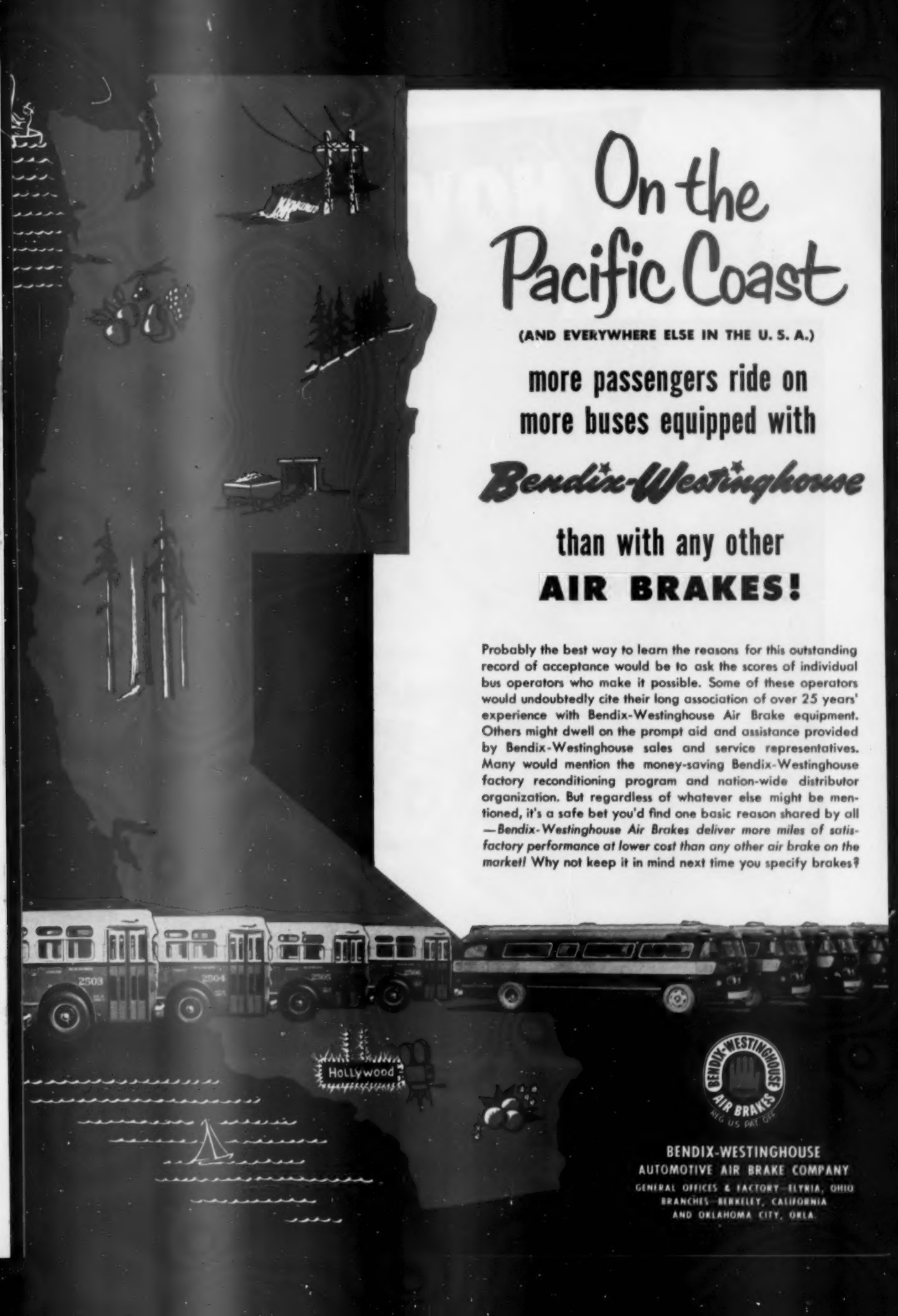

On the Pacific Coast

(AND EVERYWHERE ELSE IN THE U. S. A.)

more passengers ride on more buses equipped with

Bendix-Westinghouse

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Probably the best way to learn the reasons for this outstanding record of acceptance would be to ask the scores of individual bus operators who make it possible. Some of these operators would undoubtedly cite their long association of over 25 years' experience with Bendix-Westinghouse Air Brake equipment. Others might dwell on the prompt aid and assistance provided by Bendix-Westinghouse sales and service representatives. Many would mention the money-saving Bendix-Westinghouse factory reconditioning program and nation-wide distributor organization. But regardless of whatever else might be mentioned, it's a safe bet you'd find one basic reason shared by all —*Bendix-Westinghouse Air Brakes deliver more miles of satisfactory performance at lower cost than any other air brake on the market!* Why not keep it in mind next time you specify brakes?

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YOU CAN BRING DOWN maintenance costs and cut your fuel consumption—gasoline or Diesel—by lubricating engines with heavy duty *Texaco D-303 Motor Oil*. This fully detergent and dispersive oil keeps engines free from harmful sludge, gum and carbon deposits, keeps rings free in their grooves.

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Piston Ring Sets deliver the world's best

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Millions of road-miles have thoroughly proved that the CHROME TOP COMPRESSION RING in Sealed Power KromeX Sets has what it takes to fight heat, friction, corrosion, and abrasion—to stand up under the terrific pressures of modern engines. And because this ring is *factory-seated* —factory-lapped to a light-tight finish for fast break-in—there is no long, oil-wasting wait for the ring to seat itself. Its operation is efficient, and economical with oil, from the start. Other important Sealed Power KromeX performance features include chrome-faced rails on the MD-50 Steel Oil Ring, and the world-famous FULL-FLOW SPRING. No other piston ring set duplicates Sealed Power KromeX results.

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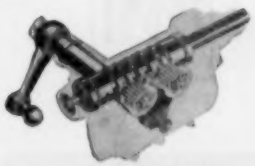
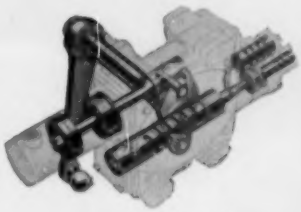


Cam & Lever MANUAL



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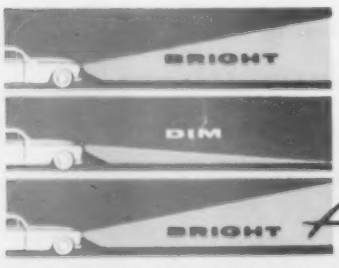

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Howard E. "Ernie" Schenck
President, Schenck Transportation Co.

GM *Diesel*

SAVINGS MOUNT UP

for Long Island Operator . . .

Only **2.06** cents a mile for maintenance **labor** and **parts**

Everywhere that GM Diesels are put to work, the story is the same: They save money, —lots of it.

Schenck Transportation Company, Floral Park, Long Island, placed their first GM Diesels, ten model TDH-3610's, in service in April, 1951.

These coaches, which now average 160,421 miles each, have been maintained for the very low figure of 2.06 cents a mile for maintenance labor and parts. And this with mechanic rates over $2.00 an hour.

Four repairmen maintain the Diesel fleet, now expanded to 25 units, while 12 mechanics are required for the company's fleet of 40 gasoline-powered coaches. Yet the Diesels operate nearly three times the mileage (111,857 vs. 41,370 in November, 1953).

Using 20 Diesels in base schedules the company operates 101.7 route miles —80% of it local operation. 24 out of 25 Diesels are scheduled every day.

Riding has increased on the Flushing-Roslyn-Glen Cove line with introduction of Diesels . . . due, the company believes, to better maintained schedules and smoother riding equipment.

6.48 miles per gallon of fuel

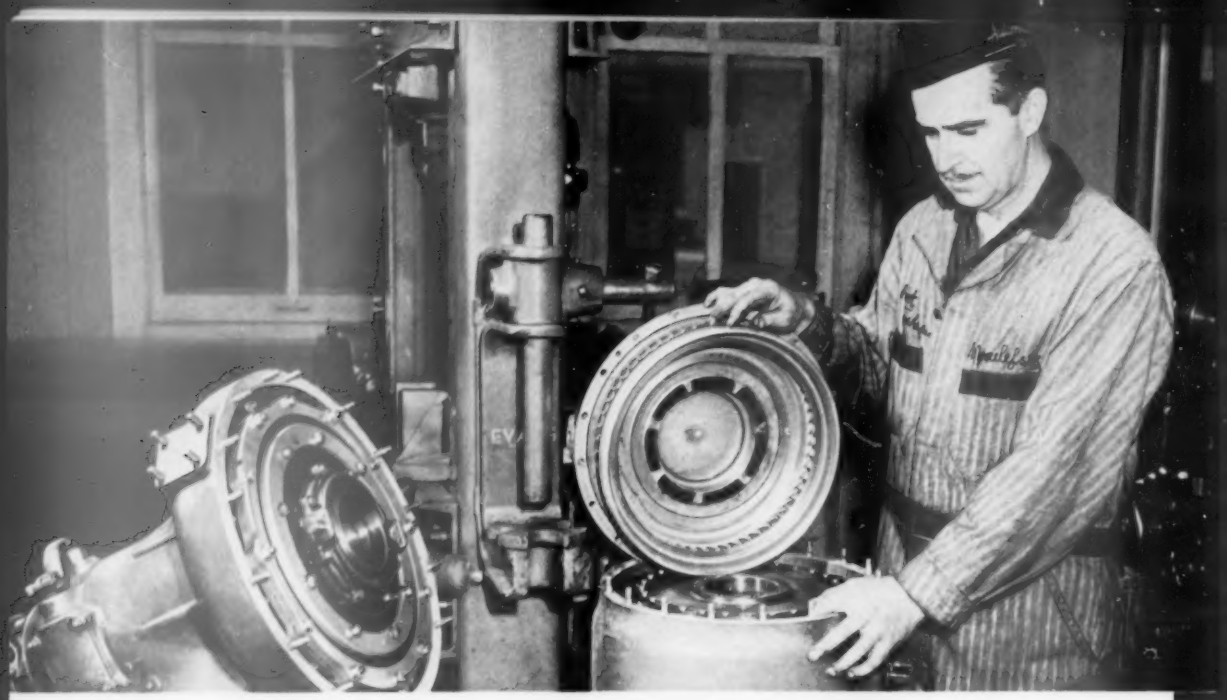
Based on average annual per vehicle miles of 47,000, yearly Diesel savings in fuel costs on this property exceed $1000 per coach, the company's records show:

JANUARY—AUGUST 1953	BUS MILES	M.P.G. FUEL	M.P.Q. ADDED OIL
25 GM Diesels (38-passenger)	790,087	6.48	532
40 Gas-powered Coaches (34-passenger average)	557,418	3.61	122

Road Calls—April 14, 1951 through November 7, 1953

Diesel Road Calls	377*	Diesel Miles Per Call	6,697
Gasoline Road Calls	2,657	Gasoline Miles Per Call	1,227

*Only 3 actual road failures—other Diesel calls involved no interruption in service.



Outstanding **Hydraulic "V"** Drive performance

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"Wagner Rotary Air Compressors

have been in constant service since Oct. 1951 with no failures or need for repairs" says D. R. STRANG, Supt. of Maintenance, Waukegan-North Chicago Transit Co., Waukegan, Ill.

You, too, can profit from the experience of bus operators like D. R. Strang of Waukegan-North Chicago Transit Company. They know that *good* brakes are no accident—they know they can *rely* on the proven safety of Wagner Rotary Air Compressors. Regardless of the size or type of bus fleet you operate, you can benefit in greater passenger safety and lowered maintenance costs when you specify and install Wagner Rotary Air Compressors—standard on all Wagner Air Brake Systems. Gain better performance because of these Wagner Rotary Air Compressor features:

- **Rotary motion**
- **Uniform torque load**
- **Fast air recovery**
- **Reduced carbon and sludge formation**
- **Compact installation**
- **Minimum preventive maintenance**
- **Ample air pressure for all emergencies**

Be sure of your brakes! Investigate now the many practical and profitable advantages of changing over to Wagner Air. Remember, no other air brake system has the famous Wagner Rotary Air Compressor. Get all the details and data on Wagner Air in the free copy of Wagner Bulletin KU-201 that is yours for the asking. Once you learn about Wagner, you too will find it good business to specify Wagner Air Brakes when ordering new equipment.

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1400 WEST TENTH STREET
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TELEPHONE ONTARIO 1200

October 29, 1953

Wagner Electric Corporation
6400 Plymouth Avenue
St. Louis 14, Mo.

Gentlemen:

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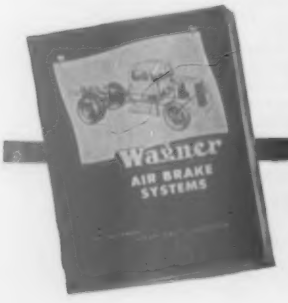
In our opinion, Wagner Rotary Air Compressors may be installed easily, definitely stopped the formation of carbon, and have faster recovery of air pressure to assure safe braking whenever needed. On the diesels we operate, Wagner Rotary Air Compressors have been in constant service by us since October, 1951 with no compressor failures or need for repairs.

Yours truly,

Don R. Strang

D. R. Strang
Superintendent of Maintenance

DRS:pj



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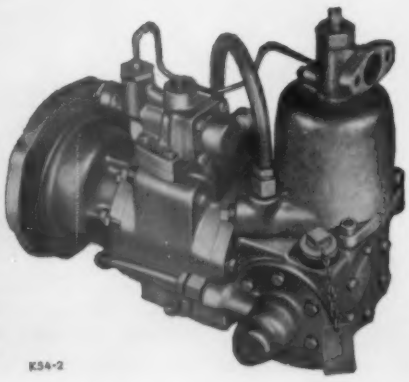

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St. Louis, Missouri . . . . . (1,208 busses)
Niagara Frontier Transit System Inc.
Buffalo, New York . . . . . (820 busses)
Houston Transit Co.
Houston, Texas . . . . . (559 busses)
Atlantic Greyhound Corp.
Charleston, W. Virginia . . . . . (476 busses)
Teche Greyhound Lines
New Orleans, Louisiana . . . . . (252 busses)
United Transit Co.
Providence, Rhode Island . . . . . (416 busses)
Louisville Transit Co.
Louisville, Kentucky . . . . . (409 busses)
The Memphis Street Railways, Inc.
Indianapolis, Indiana . . . . . (353 busses)
Dixie Greyhound Lines Inc.
Memphis, Tennessee . . . . . (211 busses)
Harrisburg Railways Co.
Harrisburg, Pennsylvania . . . . . (149 busses)
Delaware Coach Co.
Wilmington, Delaware . . . . . (138 busses)
Southern Pennsylvania Bus Co.
Chester, Pennsylvania . . . . . (92 busses)
Ohio Valley Bus Co.
Huntington, W. Virginia . . . . . (76 busses)
New England Greyhound Lines, Inc.
Boston, Massachusetts . . . . . (92 busses)
Indiana Motor Bus Co.
Plymouth, Indiana . . . . . (39 busses)
The Bristol Traction Co.
Bristol, Connecticut . . . . . (16 busses)

16 OUT OF 17...

1953 MAINTENANCE AWARD WINNERS

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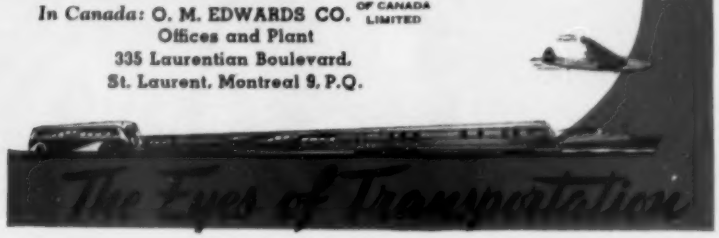


"We check all our spark plugs at regular intervals on the Champion testing unit!"

TRUCK MIXED CONCRETE

Cooper SUPPLY CO.

LOADING STATIONS
6480 EAST EIGHT MILE ROAD
JOY ROAD AND FREELAND
VAN DYKE AND SIXTEEN MILE

6480 EAST EIGHT MILE ROAD, DETROIT 34
TWINBROOK 1-4040

Champion Spark Plug Co.
Toledo 1, Ohio

December 29, 1953

Gentlemen:

Spark plugs are a mighty important item in our business. We operate 78 concrete mixer trucks—two engines each, ten trailer-trains, twelve heavy-duty tractor units, a total of about a dozen pickups, dump trucks and light tractor units plus assorted cranes and bulldozers. The fleet will log over 2,750,000 miles a year and, of course, there are many thousands of hours of operating time on the industrial engines. So, you may be interested in what our Fleet Superintendent, Mr. W. N. Lyons, has to say about the performance of the Champions used in this equipment.

"We have a rigidly enforced preventative maintenance schedule that includes checking our spark plugs on the Champion F600 testing unit at regular intervals. In the 17 years I've worked for Cooper we've never found any spark plugs that could give us the performance, long life and selection of heat ranges that Champion Spark Plugs offer. We try all makes of plugs but Champions always come out the winner."

I congratulate you on building spark plugs that deliver such dependable service.

Sincerely,
COOPER SUPPLY COMPANY

Gage W. Cooper

Gage W. Cooper
President

GWC:CC

4 times greater resistance to trouble!

OTHER THERMOID HEAVY DUTY PRODUCTS FOR COMMERCIAL FLEETS

Thermoid BT Neoprene Radiator Hose is built to meet the most severe conditions of bus and truck operation. Neoprene both inside and out, it provides four times greater resistance to oil, grease and gas fumes . . . withstands 100° higher outside temperatures than ordinary hose . . . will not char or blister. Plied cord construction allows flexibility that withstands misalignment and vibration. Test Thermoid BT Neoprene Hose on the toughest job in your fleet.

Thermoid

Thermoid Company • Trenton, New Jersey

Brake Linings • Fan Belts • Radiator Hose • Hydraulic Brake Parts and Fluid • Car Mats • Clutch Facings • Thermoid Precision Process Equipment.

THE ENGINEER'S REPORT

DATA

LUBRICANT RPM Delo Oils

UNIT 8 cyl. 165 H.P. gasoline engine

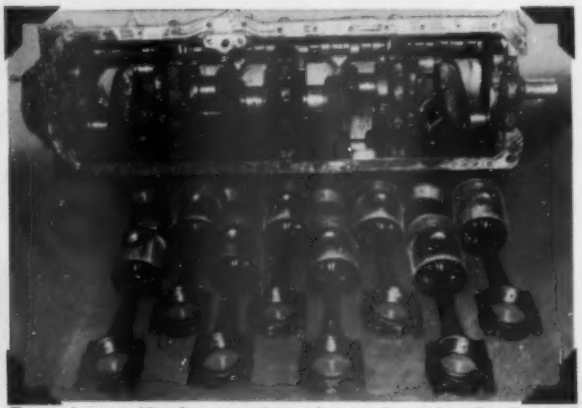
SERVICE Suburban bus

CONDITIONS Many traffic stops, cold engines, heavy pulls on hills

FIRM The Gray Line, Inc. of San Francisco

Over 83,000 stop-and-go miles before overhaul!

RPM DELO SPECIAL LUBRICATING OIL cuts operating costs by keeping engines clean and reducing wear in more than 400 busses and cars operated in the San Francisco Bay area by The Gray Line, Inc. Overhauled for the first time after 83,579 miles in hilly San Francisco, the bus engine above showed only 0.0015 inch average wear on mains, only 0.009 average taper in cylinders...despite a heavy-traffic run, many stops.



NO STUCK OR BROKEN RINGS were found on any of the eight pistons. Con-rod bearings were unscored and piston walls lacquer-free, as this photo shows.

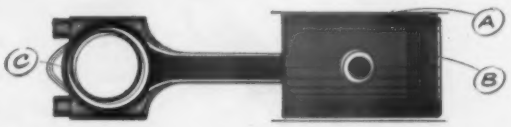
REMARKS: Besides "Sightseers," Gray Line operates an airport limousine service, charter busses, chauffered limousines and U-drive cars. Mr. P. J. McNamee, Mgr. of Operations, says, "RPM DELO Oil has reduced operating costs greatly by keeping our engines clean and reducing wear." There is an RPM DELO Oil to meet every heavy-duty engine operating condition.

FREE BOOKLET on the RPM DELO Oils gives you complete information. Write or ask for it today.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

How RPM DELO Oils keep engines clean and prevent wear



A. Contain special additives that provide metal-adhesion qualities...protect parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean...helps prevent piston scuffing.

C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco 20
THE CALIFORNIA OIL COMPANY • Barber, New Jersey
STANDARD OIL COMPANY OF TEXAS • El Paso
THE CALIFORNIA COMPANY • Denver 1, Colorado

New!

VAN NORMAN No. 253 Camshaft Grinder

Now it's *camshaft grinding* . . . for more power, smoother idling, and increased efficiency. And here's another profit-producing Van Norman machine to round out your shop operation . . . the new No. 253 that quickly and accurately grinds pleasure car, tractor, truck and hot-rod camshafts . . . and camshaft main bearings, too. Here are some of its top features:

1. Quickly and accurately produces master cams with exclusive Van Norman turning and grinding method.
2. Positive and exclusive control for taper-grinding cam lobes.
3. Precision-indexed head for positive cam location.
4. "Rapi-matic" wheel retractor.
5. Positive semi-automatic size-control.

For full facts on these and many other features, see your jobber or write Van Norman Co., Springfield 7, Mass.

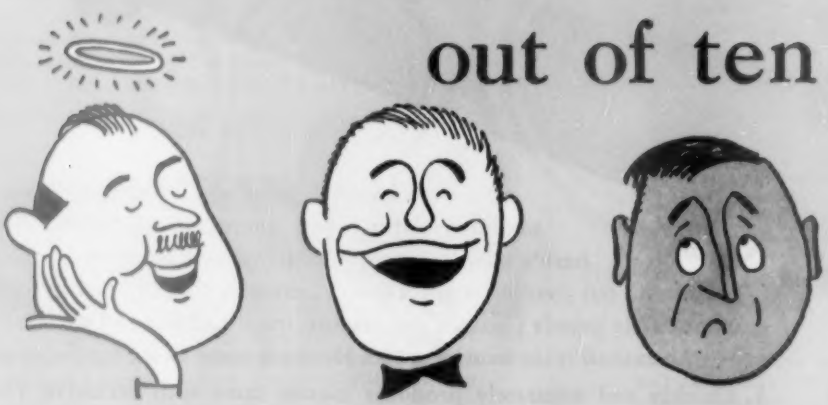
Until you purchase your machine, take your work to the shop that displays this sign.

The Best-Equipped Shop Gets the Business! That's why **"It Pays to Van Normanize"**

last year again . . .

seven men

out of ten



specified Rub-Bub flooring

In 1953, for the seventh successive year, over seven out of ten urban transit vehicles delivered were equipped with Rub-Bub safety flooring! And for good reason! Rub-Bub Heavy-Duty Safety Platform Plate, Step Plate, Aisle Tread and Underseat Flooring keep accidents and flooring replacements low in thousands of installations. For maximum safety and longer flooring life, specify Rub-Bub safety flooring in all your new and reconditioned vehicles.

RUB-BUB®
Transportation Products

SAMUEL MOORE & CO. MANTUA, OHIO

IN CANADA | SAMUEL MOORE & CO. OF CANADA, LTD.
Represented in Canada exclusively by
RAILWAY & POWER ENG. CORP.

BUS TRANSPORTATION

TOP TOPICS

HIGHLIGHTS OF LAST MINUTE DEVELOPMENTS IN THE BUS INDUSTRY AS WE GO TO PRESS

February, 1954

TAX EXEMPTION FOR TRANSIT WILL SAVE A FORTUNE for the people of the U. S. -- and a "fortune" means $240 million a year. That's what a former New York State senator proves, with facts and figures, in the article starting on page 40 of this issue. Frankly, we think this story is sensational . . . and so do those who got wind of it before this issue went to press. Evidently transit men feel they can use it to waken the public in their own communities, for requests for reprints started rolling in several weeks ago. We think you'll be as excited as we were at this new idea in the transit tax story!

A NEW FARE RAISE IN PHILADELPHIA brought a startling about-face by Mayor Joseph Clark. His Honor, faced with a unanimous Superior Court decision in favor of a fare hike from 15 to 18 cents, dropped plans to carry the fight to the State Supreme Court...came up with a plan aimed at solving the city's transit problems. One key proposal: the city will buy up to 600 new buses and lease them back to PTC to aid the company in its rails-to-rubber program. First PTC reaction is favorable to the plan.

SPECIAL RIGHTS OF WAY FOR TRANSIT VEHICLES have been urged as a solution to the Los Angeles traffic problem. The urger was Harry Morrison, general manager of a big LA merchants' association. The cost? It should be paid by all the people, since it's too big for private transit firms to handle alone. "But this does not mean municipal ownership," Morrison warned. "That would shift the problem, not solve it."

TRANSIT FARE IN WASHINGTON, D.C. WENT TO 20 CENTS last month, making the nation's capital the 21st city in the land to reach that mark. Capital Transit's former fare was 17 cents, with five tokens for 75 cents. Under the new fare schedule five tokens sell for 80 cents.

OVERLAND GREYHOUND AND CONTINENTAL TRAILWAYS tried to lower fares into Omaha, but the people wouldn't let them! The two carriers

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announced they'd haul women shoppers from 47 Nebraska towns into Omaha at a special half-price fare. The State Railway Commission had already given permission when the 47 towns, led by their local merchants, protested vigorously. Overland and Continental promptly withdrew their offer... revealed that they'll work out another plan which would give more towns the benefit of the shoppers' special rate.

MACK TRUCKS, INC. WILL EXPAND UNDER ITS PRESENT MANAGEMENT. That was the essence of a joint statement released by E. D. Bransome, chairman and president of Mack, and William Kaelin, of Northeast Capital Corp., disclosed last week as holder of about 300,000 shares of Mack stock. To aid in the expansion program, Mack stockholders will be asked at the annual meeting in April to enlarge the board from nine to eleven members, and elect as directors five board members of the Northeast Corp.

IT'S POLITICS AS USUAL IN NEW YORK, where a Democratic Assemblyman from Brooklyn introduced a bill in the state legislature aimed at making New York City's Transit Authority get PSC approval before putting any fare increases into effect. Of course it's a ridiculous idea, since the TA was created by the state and ordered to operate the city's transit system without a deficit...a trick they can hardly pull off without power over fares. Meanwhile, the TA was saved from a hidden enemy as...

POLICE SMASHED A GIGANTIC COUNTERFEIT TOKEN RING which planned on manufacturing and distributing 25 million phoney tokens. If they were all used just once it would have cost the Transit Authority $3,750,000 in lost revenue. As it was, better than 200,000 were put in circulation. The slugs were such good imitations they got by the TA's "slug-crusher" mechanism on turnstiles. Three men were arrested as ringleaders and nine other suspects picked up after city detectives were tipped off that cut-rate tokens were being offered for sale in the Broadway area of the city.

ICC HAS GIVEN ITS OK TO THE PURCHASE OF NORFOLK SOUTHERN Bus Co., with headquarters in Norfolk, Va., by Carolina Coach Co., a Trailways carrier based in Raleigh, N.C. Reported purchase price: about $519,000. Immediately after the purchase Carolina Coach announced it was working on stepped-up schedules

to points deep in the Southeast...will reveal the improvements as soon as Norfolk Southern joins its operations.

THE DES MOINES TRANSIT COMPANY TOOK OVER OWNERSHIP and operation of that city's bus and trolley coach fleet last month, ending 25 years of operation by the bankrupt Des Moines Railway Co. C. W. Gifford, who had been president and general manager of the Railway Co., was immediately named operating manager of the new firm.

"WE WON'T PAY A FRANCHISE TAX THIS YEAR," Carl Davis, president of the Springfield (Ill.) Transportation Co. told the City Council. The due date came and passed...the company stuck to its guns and didn't pay up. STC had been fighting the tax, amounting to about $35,000, in a series of newspaper ads pointing out the unfairness of a franchise tax...and the financial inability of the transit firm to pay it. If the city brings suit, as it threatens to do, the case is likely to assume industry-wide importance.

PORTLAND TRACTION CO. GOT A FRANCHISE TAX REDUCTION, from five per cent to one per cent. The action by Council members in the Oregon city came after the transit firm had presented arguments against the tax...will save Portland Traction an estimated $10,000 a year.

BIG INTERCITY CARRIERS WILL HAVE TO DO SOMETHING to help the small carriers that feed them, according to Don Boyd, director of the Motor Transportation Dept. of the Nebraska State Railway Commission. Small feeder bus lines, he pointed out, are finding the going hard because of high costs and low revenues. "If the big bus companies want feeders," he said, "they may have to subsidize them in some way."

LOS ANGELES' FAMOUS SMOG IS IN THE BUS BUSINESS, where it's become a major factor in Metropolitan Coach Lines' application to convert two of its remaining six rail lines to buses. City officials turned a cool ear toward the proposal at first, claiming buses would increase the smog. MCL countered with expert testimony that new diesels, burning a new diesel fuel, contribute practically nothing to the smog menace. Besides, said MCL, 1,000 buses don't produce any smog at all compared to the city's 2,000,000 private autos.

The Public Would Gain by Transit Tax Exemption

THE TRANSIT INDUSTRY ended 1953 with another unhealthy drop in revenue passenger totals! There is no sign yet that the decrease in transit riding is leveling off at some stable point.

That's one of the several significant facts revealed in BUS TRANSPORTATION's 32nd annual review of the bus industry in this issue.

Yet, despite the highly competitive factors which transit faces today, the industry is still burdened with monopolistic forms of taxes which drain away its lifeblood.

Lowell H. Brown, in an article on "Transit Tax Exemption" which begins on page 40 of this issue, points out that these burdensome taxes are "levied on a service which is vital to the public."

That's the one essential fact which our public officials have not grasped as yet.

If, as Mr. Brown contends, transit tax exemption would not cost the public a single cent . . . but would actually save millions of dollars . . . then it's about time that public officials were awakened to this fact.

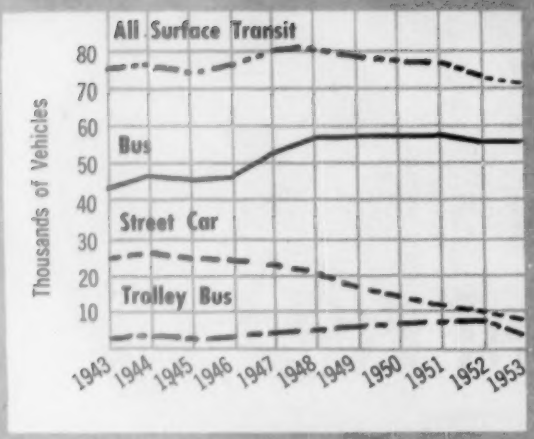
That awakening should be the individual and collective responsibility of transit in every community for 1954.

THE EDITORS

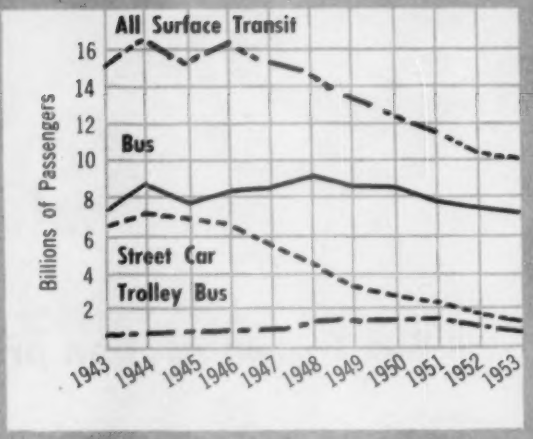
Bus Transportation presents its . . .

Annual Review of Industry Progress

Top facts about the billion dollar bus industry in 1953



Vehicles



Passengers Carried

ANNUAL REVIEW OF INDUSTRY PROGRESS
BUS TRANSPORTATION
FEBRUARY · 1954

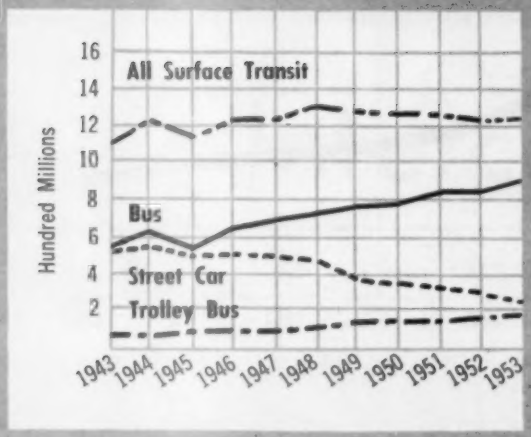
Transit Trends . . .

Revenue passengers in 1953 continued to decline. Operating revenues, however, showed decided improvement over 1952, with much of the increase reflected in the net operating revenue column

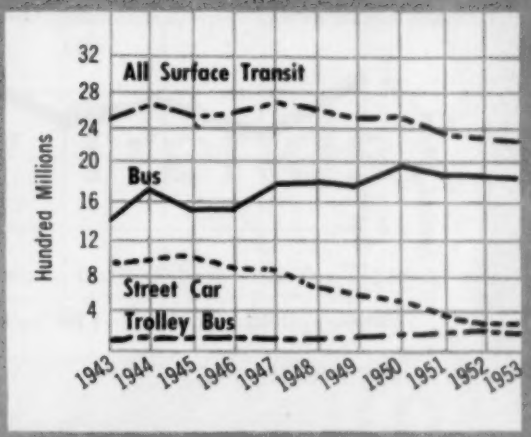
Motor Bus

	1953*	1952	1951
Number of Companies	1,550	1,626	1,676
Buses Owned	56,400	56,456	58,364
Miles of Highway	60,300	54,229	59,680
Operating Revenue	$931,673,000	$888,577,000	$833,532,000
Taxes Assignable to Operations	$77,515,000	$76,684,000	$68,714,000
Net Operating Revenue	$24,410,000	$17,150,000	$12,086,000
Revenue Passengers Carried	6,687,000,000	7,138,000,000	7,470,000,000
Total Bus Miles	1,855,988,000	1,877,200,000	1,896,960,000
Employees on Payroll	122,750	124,425	128,850

*Preliminary



Revenue



Miles Operated

Trolley Buses

	1953*	1952	1951
Number of Companies	41	41	43
Trolley Buses Owned	6,958	7,182	7,059
Miles of Highway	1,487	1,487	1,496
Operating Revenue	$148,065,000	$145,500,000	$131,850,000
Taxes Assignable to Operations	$7,900,000	$7,350,000	$5,343,000
Net Operating Revenue	$14,475,000	$15,438,000	$15,828,000
Revenue Passengers	1,138,900,000	1,205,200,000	1,226,000,000
Total Bus Miles	204,525,000	210,800,000	206,000,000
Employees on Payroll	16,220	16,742	16,350

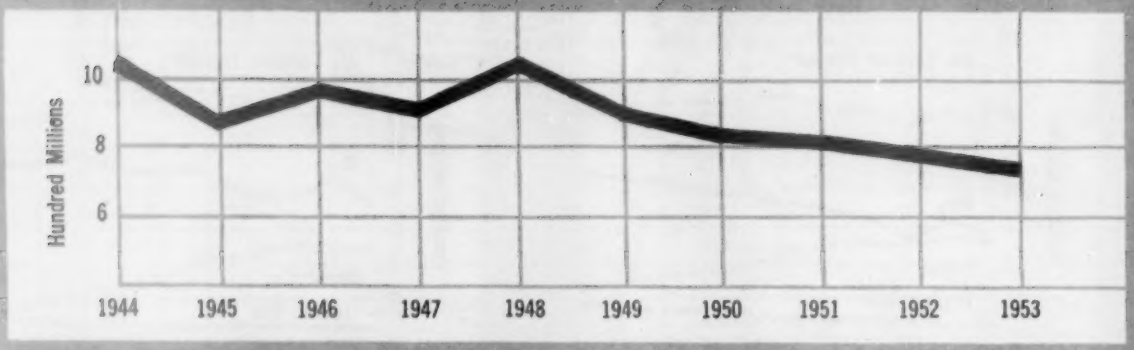
*Preliminary

Street Cars†

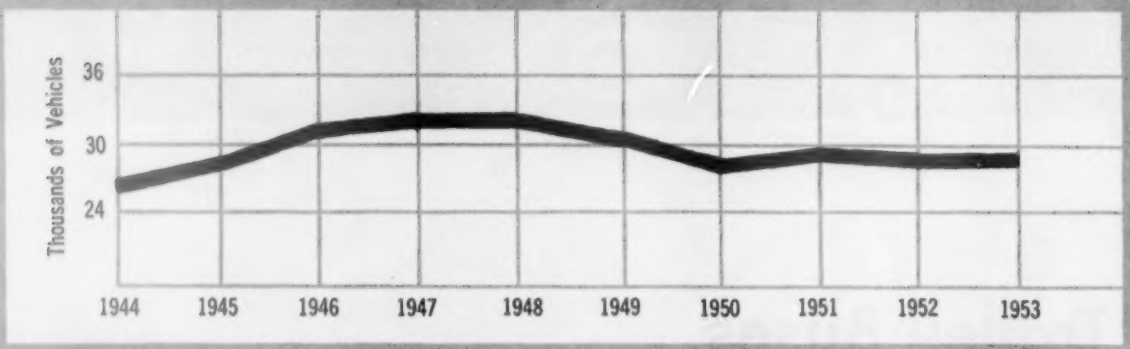
	1953*	1952	1951
Number of Companies	71	74	81
Number of Cars Owned	8,400	9,700	10,960
Miles of Single Track	6,600	7,309	8,240
Miles of First Main	3,500	3,872	4,407
Operating Revenue	$257,000,000	$279,700,000	$318,900,000
Revenue Passengers	1,424,000,000	1,714,000,000	2,171,000,000
Revenue Miles Operated	276,000,000	321,200,000	387,600,000

†Street car data supplied by American Transit Association

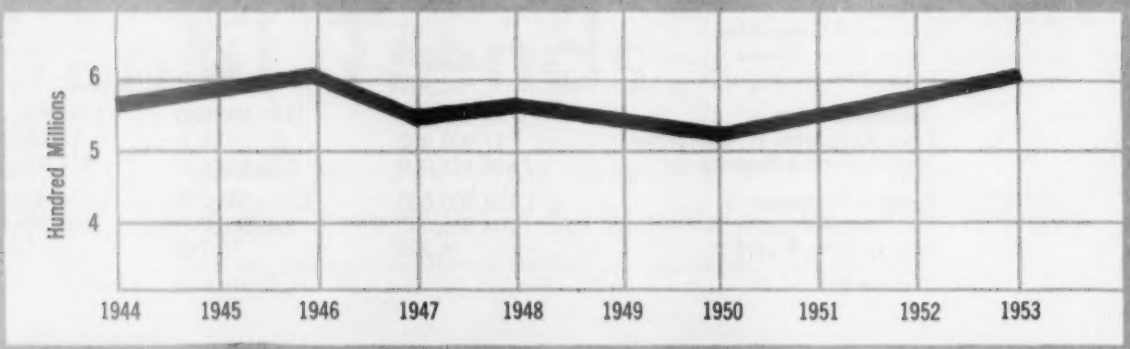
*Preliminary



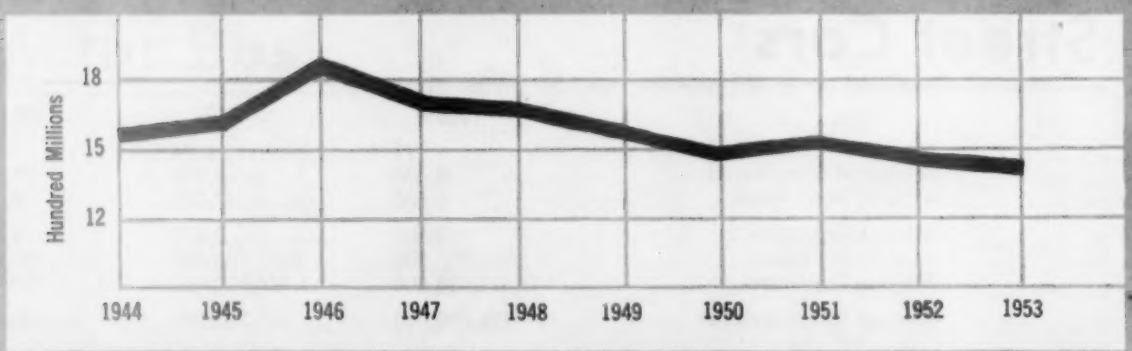
REVENUE PASSENGERS



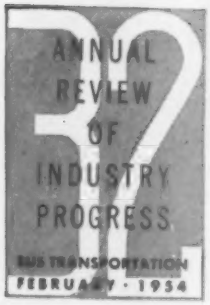
BUSES OWNED



OPERATING REVENUES



MILES OPERATED



Intercity Trends . . .

- **The year 1953 was certainly not the best year for intercity carriers—the downward trend in riding was still apparent . . . but the all-important revenue picture improved.**
- **Revenues for 1953 were up 4.85 per cent over 1952, while passengers carried showed a drop of 5.38 per cent.**
- **A slight drop was recorded for total bus miles, as well as the total size of the intercity fleet.**

	1953*	1952	1951
Number of Operating Companies (year end)	2,650	2,847	2,914
Long Haul	880	970	976
Short Haul	1,770	1,877	1,938
Number of Buses Owned (year end)	28,500	28,563	29,266
Long Haul	18,950	18,997	19,063
Short Haul	9,550	9,566	10,203
Miles of Highway Covered (a)	404,500	439,436	438,447
Long Haul	336,000	369,171	368,791
Short Haul	68,500	70,265	69,656
Operating Revenue	$603,610,000	$575,676,000	$564,441,000
Long Haul	480,193,000	459,080,000	456,100,000
Short Haul	123,417,000	116,596,000	108,341,000
Taxes Assignable to Operation	$46,466,000	$45,518,000	$45,567,000
Long Haul	36,482,000	35,945,000	36,900,000
Short Haul	9,984,000	9,573,000	8,667,000
Net Operating Revenue	$62,518,000	$56,564,000	$56,118,000
Long Haul	59,544,000	54,631,000	54,276,000
Short Haul	2,974,000	1,933,000	1,842,000
Revenue Passengers Carried	737,113,000	779,023,000	823,133,000
Long Haul	333,446,000	353,520,000	381,560,000
Short Haul	403,667,000	425,503,000	441,573,000
Total Bus Miles	1,455,183,000	1,480,283,000	1,519,273,000
Long Haul	1,144,155,000	1,165,700,000	1,203,650,000
Short Haul	311,028,000	314,583,000	315,623,000
Number of Employees on Payroll (b)	62,350	62,790	63,100
Long Haul	47,830	48,213	47,615
Short Haul	14,520	14,577	15,485

(a) Year end total includes duplication between carriers.
(b) Does not include commission agents and terminal company employees.
*Preliminary

Seating Capacity	INTERCITY TYPE					TRANSIT TYPE				
	1949	1950	1951	1952	1953	1949	1950	1951	1952	1953
11	...	26	...	37	...	...	...	...	...	11
12	23	...	25	1	52	...	...	...	...	4
15	...	...	...	...	...	...	...	...	...	...
16	10	10	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	14	...	...	...
20	...	...	...	...	...	...	...	...	...	...
21	4	3	...	...	...	...	1	16	...	...
23	10	...	...	...	...	...	...	...	...	...
24	...	9	...	9	1	...	...	...	...	...
25	12	...	9	...	13	...	1	...	...	...
26	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	331	175	61	12	24
28	15	33	32	15	5	...	1	...	1	...
29	162	124	96	560	68	141	19	38	24	2
30	...	...	...	...	...	22	...	9	3	4
31	...	2	4	...	...	386	190	725	161	92
32	28	...	...	...	...	118	13	17	39	11
33	84	35	40	25	19	151	46	105	39	1
34	...	...	...	...	...	14	9	24	9	8
35	...	...	...	14	...	37	186	250	123	89
36	6	4	622	1,145	...	416	488	592	257	93
37	358	286	1,877	242	39	231	112	67	33	135
38	...	...	...	...	...	19	4	2	4	10
39	...	...	...	...	...	34	66	...	4	7
40	1	1	...	...	...	102	28	38	36	...
41	129	165	903	512	711	13	14	62	26	34
42	1	1	...	...	...	...	26	25	1	2
44	...	...	...	3	...	182	10	77	139	76
45	20	...	...	170	6	1,391	1,236	1,258	653	696
48	...	44	...	...	...	...	...	2	48	133
49	...	...	...	...	...	...	...	...	78	...
50	...	...	...	...	...	...	87	462	141	63
51	...	...	...	...	...	187	324	432	539	671
52	...	...	...	...	...	...	...	509	...	137
55	...	7	...	...	...	...	...	1	...	64
58	...	5	...	...	...	...	10	...	...	165
Total	863	755	3,608	2,733	914	3,775	3,060	4,772	2,370	2,532

1949 Grand Total – 21,124
Included 518 Common Carrier Buses for export, 14,480 Domestic School Buses and 1,412 for Export, 25 Sightseeing and 50 Miscellaneous Buses.

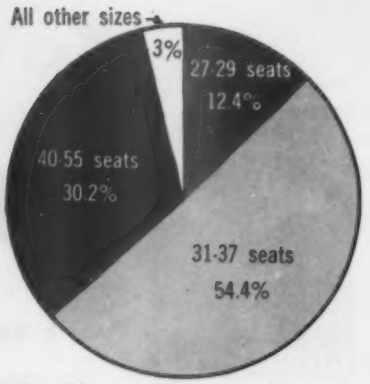
1950 Grand Total – 22,808
Included 853 Common Carrier Buses for Export, 16,055 Domestic School Buses and 1,762 for Export, 46 Sightseers and 277 special purpose vehicles which include Highway Post Office buses.

1951 Grand Total – 29,149
Includes deliveries to U.S. Government, 693 Common Carrier Buses for Export. 19,064 Domestic School Buses and 970 for Export, 18 Sightseers and 24 Special Purpose Vehicles.

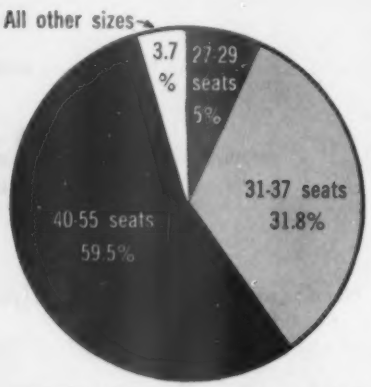
1952 Grand Total – 24,971
Includes deliveries to U. S. Government, 674 Common Carrier Buses for Export, 149 Sightseers and 63 Special purpose vehicles. 17,200 School Buses and 1,785 for Export.

1953 Grand Total – 19,540
Includes 361 Common Carrier Buses for Export and 85 Sightseers for Domestic Service. 14,388 School Buses for Domestic Service and 1,260 for Export.

COMMON CARRIER MOTOR BUS PRODUCTION—1949-1953 INCLUSIVE. Body figures in this table cover buses built for U.S. and Canadian Operations only. Grand totals cover all types of buses on which production is reported.



INTERCITY BUS production by bus sizes for five years 1949-1953 inclusive.



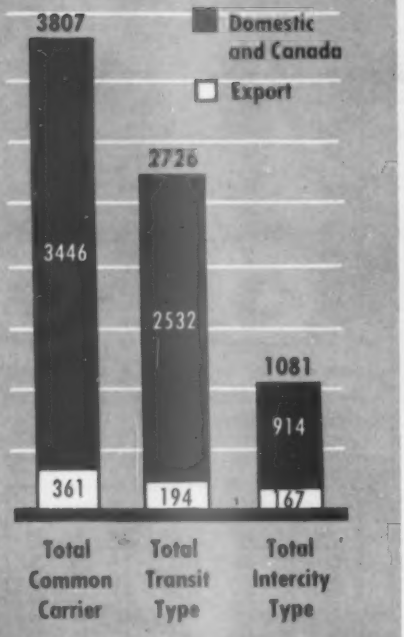
TRANSIT BUS production for same five-year period. Close to 60 per cent are 40-55 passenger capacities.

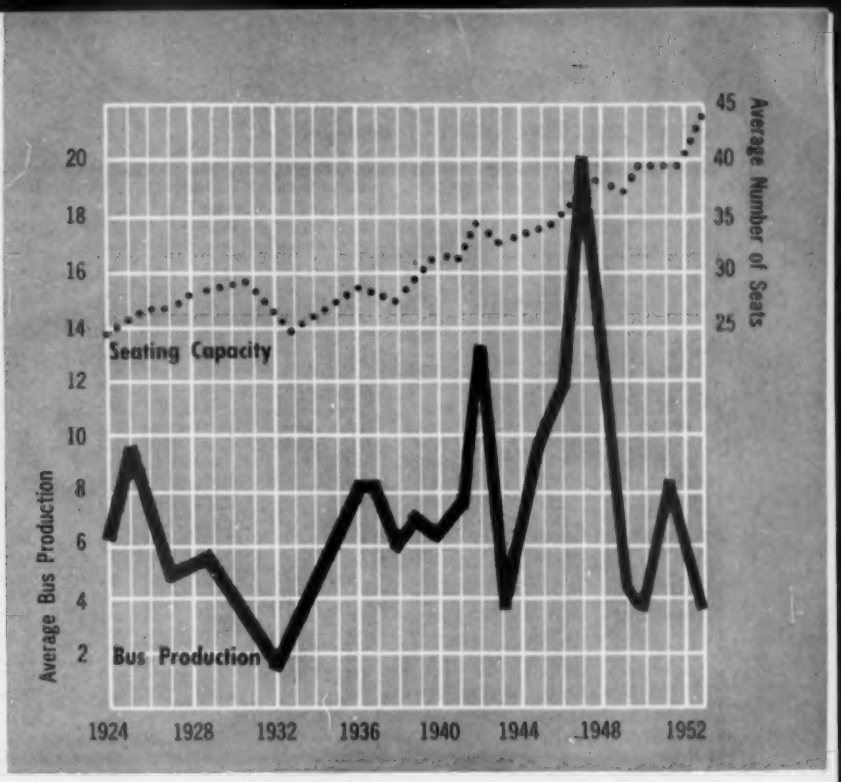
Production

By Earl F. Theisinger
Executive Editor

• WITH 3,807 BUSES BUILT and delivered to the common carrier bus industry in 1953—approximately 2,000 less than in 1952—bus production has reached its lowest volume since the war.

Of the motor buses produced in 1953, the United States and Canadian operators took delivery of 3,446 while 361 units were exported. Transit operations took 2,532 of the new vehicles while intercity carriers took 914. In 1952 a total of 2,730 intercity coaches were produced of which considerably more than half were deliv-





1953 PRODUCTION of common carrier type buses was 3,807, including export of 361 units. Transit operations took 2,726 units while intercity carriers took 1,081 vehicles. In 1952 transit bus production was 2,871 and intercity type bus production was 2,903 units. This represents a drop of 34.0 per cent for 1953 combined intercity and transit type bus production. This year's chart is missing one element. There were no trolley buses produced in 1953. Actually there were no electric vehicles of any kind produced—PCC cars, subway or rapid transit cars.

UPS AND DOWNS of common carrier bus production since 1924 is shown on this graph. Average seat capacity took a jump to 43.7 during 1953. The all-time production peak was reached in 1947. Prior to World War II the average annual production rate was about 5,800 units. For the period beginning in 1942 the annual production rate has averaged 8,800 units. The broken line curve shows the consistent upward trend in average seating capacity of vehicles from 25.2 passengers in 1933 to 43.7 passengers for 1953, a gain of 18.5 seats per bus.

# of Buses Drops Again in 1953

Reaching its lowest volume since the war, production of both transit and intercity vehicles was off for the second year.

ered to the United States Government. In the 1953 production, there were no government orders. Comparison of 1952 and 1953 production is as follows:

Transit type buses	1952	1953	% plus or minus
Domestic	2,370	2,532	6.8 plus
Export	501	194	60.0 minus
Total	2,871	2,726	5.0 minus
Intercity type buses			
Intercity type buses			
Domestic	2,730	914	66.5 minus
Export	173	167	3.4 minus
Total	2,903	1,081	62.9 minus
Total Transit & Intercity	5,774	3,807	34.0 minus

In 1953, no electric vehicles of any description—PCC cars, subway and rapid transit cars or trolley buses—were produced. However, for 1954 the trolley bus forecast does anticipate some production ranging from a minimum of 100 units up to a maximum of 300 or more, depending on developments on properties currently operating trolley buses.

Production of school buses held up well although somewhat below the previous year's production figure. In 1953 fourteen school bus body builders produced and delivered 14,388 units for domestic service and 1,260 for export. In 1952, seventeen builders turned out 17,200 bodies for domestic use and 1,785 for export.

In the eight years since the end of World War II, United States and Canadian common carrier bus operations have taken delivery of 68,242 motor coaches. Transit operating companies have taken 47,346 of these vehicles or at an average rate of 6,000 units per year. Intercity carriers have absorbed 20,866 new coaches or at an average rate of 2,600 units per year. This is shown in table on p. 32.

Year	TRANSIT No. Buses Built	TRANSIT No. Seats Required	INTERCITY No. Buses Built	INTERCITY No. Seats Required	SIGHTSEEING No. Buses Built	SIGHTSEEING No. Seats Required	TOTAL ALL TYPES No. Buses Built	TOTAL ALL TYPES No. Seats Required	TOTAL ALL TYPES Average Seating Capacity	SCHOOL BUSES No. Built
1931	1,480	44,035	1,169	31,018	57	1,281	2,706	76,334	28.2	4,411
1932	716	18,913	743	19,992	34	773	1,493	39,678	26.6	2,777
1933	1,531	30,988	787	17,860	60	3,000	2,378	59,853	25.2	2,420
1934	2,423	66,525	1,463	35,472	..	....	3,886	101,997	26.2	4,582
1935	3,978	114,656	2,255	47,172	34	712	6,267	162,540	25.9	9,363
1936	5,800	167,985	2,610	64,101	90	2,718	8,500	234,804	27.6	8,913
1937	5,947	168,083	2,430	64,424	107	2,996	8,484	235,503	28.1	9,892
1938	3,606	97,143	2,167	61,174	89	1,958	5,862	160,275	27.3	11,272
1939	4,594	143,600	2,415	67,436	100	2,884	7,109	213,920	30.1	11,546
1940	4,573	146,010	2,801	61,575	67	1,538	6,641	209,123	31.5	10,566
1941	5,873	191,756	2,088	60,996	7	164	7,968	252,916	31.7	8,622
1942*	9,010	321,237	3,968	132,064	8	224	12,986	453,525	34.9	1,856
1943*	2,070	63,290	1,691	53,671	..	....	3,762	116,961	31.1	206
1944*	4,323	144,115	1,927	64,460	..	....	6,250	208,575	33.4	3,192
1945*	5,908	190,574	3,508	119,533	..	....	9,416	318,107	33.8	8,225
1946*	8,300	281,592	3,335	108,086	..	....	11,635	389,678	33.5	12,025
1947	14,726	537,658	5,338	173,757	21	. 769	20,085	712,184	35.5	18,619
1948	7,810	316,335	3,333	115,687	60	1,824	11,202	433,846	38.8	20,513
1949	3,776	146,902	863	29,518	25	675	4,664	177,155	37.9	14,480
1950	3,060	125,994	755	26,822	46	1,392	3,861	154,208	40.0	16,055
1951**	4,772	200,053	3,608	134,513	18	630	8,398	335,196	40.0	19,064
1952**	2,370	102,761	2,730	97,497	149	5,006	5,249	205,264	40.0	17,200
1953	2,532	116,616	914	34,576	85	3,205	3,531	154,397	43.7	14,388
TOTAL	109,178	3,752,877	52,098	1,621,413	1,057	31,749	162,333	5,406,039	–	230,187

*Exclusive of vehicles delivered to U.S. Government Agencies. **Inclusive of vehicles delivered to U.S. Government Agencies.

BUSES AND SEATS—A 23-year tabulation giving total number of transit type buses, intercity buses and sightseeing buses together with the number of seats required to equip these vehicles. The average seating capacity of all such vehicles produced in each of these years also is given. The average capacity has risen consistently since 1933 when the average seating capacity of buses then being built by the manufacturers was only 25.2 passengers. By 1940 this average had jumped to 40, and in 1953 the average increased again to 43.7.

Rank	Seating Capacity	Type Service	Total Built 1949–53
1st	45	Transit	5,234
2nd	37	Intercity	2,802
3rd	41	Intercity	2,420
4th	51	Transit	2,153
5th	36	Transit	1,846
6th	36	Intercity	1,777
7th	31	Transit	1,554
8th	29	Intercity	1,010
9th	50	Transit	753
10th	35	Transit	685

TOP TEN for 1949-53 period. The order of the top two capacities has remained unchanged for three years.

INTERCITY 1st	INTERCITY 2d	INTERCITY 3d	YEAR	TRANSIT 1st	TRANSIT 2d	TRANSIT 3d
33	37	29	1944	27	40	36
37	29	33	1945	27	29	41
33	37	29	1946	27	36	45
37	33	29	1947	41	45	40
37	29	41	1948	45	44	40
37	29	41	1949	45	36	31
37	41	29	1950	45	36	51
37	41	36	1951	45	31	36
36	29	41	1952	45	51	36
41	29	37	1953	51	45	58

LEADING three bus sizes in ten years. The trend to bigger buses is clearly reflected in this tabulation.

Common Carrier Buses Built Since War's End

Year of Mfr.	Intercity Type	Transit Type	Total Both types
1946	3,335	8,300	11,635
1947	5,338	14,726	20,064
1948	3,333	7,810	11,143
1949	863	3,776	4,639
1950	755	3,060	3,815
1951	3,608	4,772	8,380
1952	2,730	2,370	5,100
1953	914	2,532	3,446
Total	20,866	47,346	68,242

Buses Get Bigger • Buses are getting bigger and bigger all the time. The common carrier buses built in 1953 had an average seating capacity of 43.7 passengers as compared to a 40-passenger average for buses built in years 1950-'52 inclusive. This means that nine '53 models will carry the same seated load as ten '50-'52 models. Only ten years ago the average bus seated 31.1 passengers. It would take 14 buses of that vintage to carry a seated load equal to ten 1953 buses.

In the five-year period 1949-'53, a total of 25,380 common carrier buses (8,870 intercity and 16,510 transit) were produced. Of these, exactly one half were large capacity buses ranging from 40 to 55-passenger capacity. This size group made up 59.5 per cent of transit production and 30.2 per cent of intercity production. The 31-37 passenger sizes accounted for 29 per cent of the total common carrier five year production. In the intercity field 54.4 were 31-37's. There is only a limited demand for small buses and vehicles of 30 passenger capacity and less have been produced only in small numbers in recent years.

Mechanical Data • Mechanical details on power plants and transmissions were furnished by manufacturers of 3,767 common carrier type buses. Of these, 2,565 had diesel power plants, 1,065 had gasoline engines and 137 were equipped to burn LP gas. Engines were mounted in the rear on 3,371 vehicles and under floor on 396.

Transmissions are about equally divided between manual gearshift and automatic devices. Torque converters were used on 1,983 and gearsets on 1,784.

The data contained in this article is based on confidential production reports supplied by vehicle builders. Only buses built and delivered in 1953 are included in these figures.

Reports from producers of 3,100 vehicles show that 1,200 units were delivered in the first half of 1953 and 1,900 in the latter half.

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1953 School Bus Census . . .

. . . as compiled by BUS TRANSPORTATION from actual and estimated figures reported by each state

	No. of Schools and School Districts Using Buses	No. of Children Carried Daily	No. of Buses	Total Bus Miles Annually	Cost of Pupil Transport.
Ala.	1,766	305,697	3,490	31,335,411	$ 6,803,080
Ariz.	310	39,230	606	4,500,000	1,180,514
Ark.	431 D	178,000	2,847	25,000,000	4,498,770
Calif.	1,340	327,000	5,500	45,500,000	13,500,000
Colo.	714	42,088	1,387	6,687,208	1,865,222
Conn.	169 D	81,353	861	6,527,490	3,064,000
Del.	90	16,000	310	2,160,000	600,556
D. C.	4	88	6	16,705	33,039
Fla.	1,046	167,674	2,119	18,579,312	4,846,864
Ga.	159 D	290,537	3,830	37,668,240	7,801,949
Idaho	175 D	51,339	974	9,031,000	2,308,359
Ill.	1,000	200,000	6,600	35,000,000	10,000,000
Ind.	890	259,769	5,743	38,168,571	11,500,000
Iowa	1,000	141,576	3,746	28,053,163	7,666,751
Kan.	2,149	65,161	2,580	22,395,432	4,596,912
Ky.	2,077	229,177	2,375	25,772,332	5,313,836
La.	66 D	239,486	3,619	22,715,640	9,248,777
Me.	493	62,619	1,311	9,248,294	2,366,374
Md.	670	134,576	1,499	9,435,062	4,254,310
Mass.	1,630	103,093	1,739	12,573,000	3,213,627
Mich.	920	265,000	4,500	34,200,000	11,000,000
Minn.	672	160,000	3,639	28,000,000	6,000,000
Miss.	2,000	204,156	4,706	25,173,481	5,656,580
Mo.	800	200,000	2,573	30,000,000	12,000,000
Mont.	934	22,808	705	6,638,758	1,981,623
Neb.	223	25,094	396	3,059,780	782,180
Nev.	76	6,241	154	3,851,584	374,591
N. H.	233	27,539	375	3,950,000	1,198,753
N. J.	479 D	142,641	2,086	27,720,000	5,589,467
N. Mex.	322	39,587	1,021	7,855,840	2,431,297
N. Y.	2,855	435,176	6,827	64,000,000	18,900,000
N. C.	1,285	432,940	6,462	42,841,705	4,928,857
N. D.	1,417 D	18,867	476	4,933,865	1,261,096
Ohio	1,292	460,579	6,814	49,490,820	11,685,652
Okla.	939	119,175	3,282	25,497,293	6,171,683
Oreg.	464	125,169	1,567	12,134,248	4,082,055
Penna.	2,200	421,744	5,937	59,400,000	15,767,029
R. I.	37 D	198,690	3,135	2,422,900	619,313
S. C.	2,820	178,598	2,812	21,000,000	3,055,526
S. D.	134	7,067	391	2,152,000	550,000
Tenn.	2,547	293,479	3,316	29,719,800	6,300,769
Tex.	1,800	358,000	7,000	52,412,500	15,911,000
Utah	39 D	46,404	496	3,588,422	1,201,044
Vt.	540	18,588	250	3,782,000	966,576
Va.	1,600	301,830	3,351	29,651,327	5,812,295
Wash.	456 D	170,975	2,547	19,661,160	5,326,710
W. Va.	1,375	195,659	1,645	14,403,755	4,172,379
Wis.	650	123,767	2,429	25,941,720	7,940,890
Wy.	192	15,927	474	3,741,688	1,247,258
TOTAL	45,480	7,950,163	130,508	1,027,591,506	$267,577,543

NOTE: The total of 45,480 for schools and school districts breaks down as follows: schools, 42,052; school districts, 3,428.

• THE NUMBER OF BUSES used to transport school children throughout the United States in 1953 set a new record. According to the latest figures made available to BUS TRANSPORTATION, a total of 130,508 buses were used in school service.

These buses traveled in excess of one billion bus miles in carrying out their daily school transportation assignments.

Record Pupil Total • The total number of pupils carried in 1953 also set a new record.

A total of 7,950,163 pupils were carried during the past year, compared to 7,064,248 in 1952.

The cost of school bus transportation during 1953 totaled $267,577,543, compared to $239,385,650 for 1952. The 1953 figure works out to $33.65 per pupil.

The 1953 figure for the number of schools and school districts using bus transportation comes to 45,480. This breaks down as follows: schools, 42,052; school districts, 3,428.

In many instances, of course, school districts are made up of a number of schools which are using buses for school transportation. Under the present system of reporting by the various states, there is no way to obtain an accurate individual count of schools within school districts.

Valid Estimates • It should be noted that the figures published in the accompanying tabulation are generally on the conservative side.

For instance, several of the states failed to provide BUS TRANSPORTATION with any figures at all.

A few others could not provide figures for 1953 in time for publication in this issue.

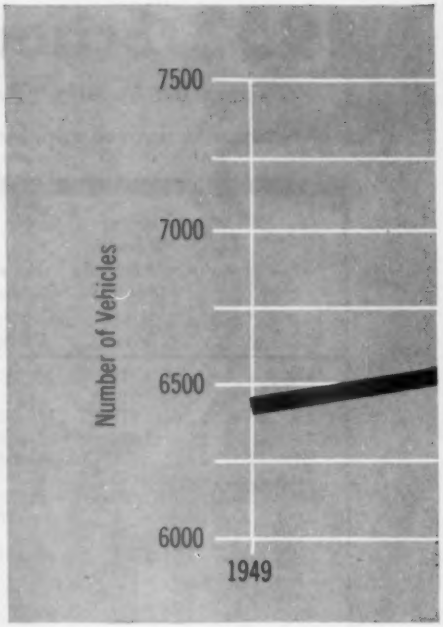
In such cases, the 1952 figures were taken and projected into conservative but higher figures for 1953, based on valid estimates of the apparent growth of school bus transportation.

In all cases, then, the figures published on this page are the latest available from actual and estimated figures reported by most states, plus estimates worked out by the BUS TRANSPORATION statistical staff.

	Trolley Buses Owned 12/31/52	No. Delivered 1953	Trolley Buses Owned 12/31/53	On Order for 1954
ALABAMA				
Birmingham Transit Co., Birmingham	148	0	148	0
ARKANSAS				
Capital Transit Co., Little Rock	31	0	31	0
CALIFORNIA				
Los Angeles Transit Lines, Los Angeles	110	0	110	0
Municipal Railway of San Francisco	398	0	398	0
COLORADO				
Denver Tramway Corp., Denver	208	0	208	0
DELAWARE				
Delaware Coach Co., Wilmington	72	0	72	0
GEORGIA				
Atlanta Transit Co., Atlanta	453	0	453	0
ILLINOIS				
Chicago Transit Authority, Chicago	679	0	672	0
INDIANA				
Fort Wayne Transit, Inc., Fort Wayne	78	0	68	0
Indianapolis Railways, Inc., Indianapolis	238	0	205	0
IOWA				
Des Moines Railway, Des Moines	149	0	149	0
KENTUCKY				
Cincinnati, Newport & Covington Railway Co., Covington	33	0	31	0
LOUISIANA				
New Orleans Public Service, Inc., New Orleans	212	0	212	0
Shreveport Railways Co., Shreveport	89	0	89	0
MARYLAND				
Baltimore Transit Co., Baltimore	190	0	190	0
MASSACHUSETTS				
Metropolitan Transit Authority, Boston	443	0	443	0
MICHIGAN				
Flint Trolley Coach, Inc., Flint	68	0	57	0
Detroit Street Railways, Detroit	140	0	140	0
MINNESOTA				
Duluth-Superior Transit Co., Duluth	32	0	32	0
MISSOURI				
Kansas City Public Service Co., Kansas City	176	0	176	0
St. Joseph Railway, Light, Heat & Power Company, St. Joseph	35	0	35	0
NEW YORK				
New York Transit System (BMT Div.)	200	0	208	0
NORTH CAROLINA				
Duke Power Co., Greensboro, N. C. Div.	15	0	20	0
Greenville, S. C. Div.	37	0	32	0
OHIO				
Akron Transportation Co., Akron	70	0	70	0
Cincinnati Transit Co., Cincinnati	308	0	268	0
City Railway Co., Dayton	164	0	150	0
Cleveland Transit System, Cleveland	411	0	461	0
Columbus Transit Co., Columbus	232	0	225	0
Dayton-Xenia Railway Co., Dayton	13	0	13	0
Oakwood Street Railway Co., Dayton	19	0	19	0
Youngstown Municipal Railway Co., Youngstown	66	0	61	0
OREGON				
Portland Traction Co., Portland	188	0	161	0
PENNSYLVANIA				
Johnstown Traction Co., Johnstown	6	0	6	0
Philadelphia Transportation Co., Philadelphia	167	0	159(a)	0
Wilkes-Barre Transit Corp., Wilkes-Barre	68	0	68	0
RHODE ISLAND				
United Transit Co., Providence	229	0	110	0
TENNESSEE				
Memphis Street Railway Co., Memphis	229	0	229	0
TEXAS				
Dallas Railway & Terminal Co., Dallas	70	0	80	0
WASHINGTON				
Seattle Transit System, Seattle	307	0	307	0
WISCONSIN				
Milwaukee and Suburban Transport Corp.	400	0	400	0
Total – United States only	7,170	0	6,958	0
HAWAII				
Honolulu Rapid Transit, Honolulu	115	0	100	0
Total – United States & Possessions	7,285	0	7,058	0

(a) Includes 28 Owned by city, leased and operated by PTC.

TROLLEY BUS OPERATIONS as of Dec. 31, 1953. Although total vehicles in the nation's fleet are down from last year, the number of trolley bus carriers remains at 41, the same as last year.



AS THE RESULT OF SCRAPPING OLD

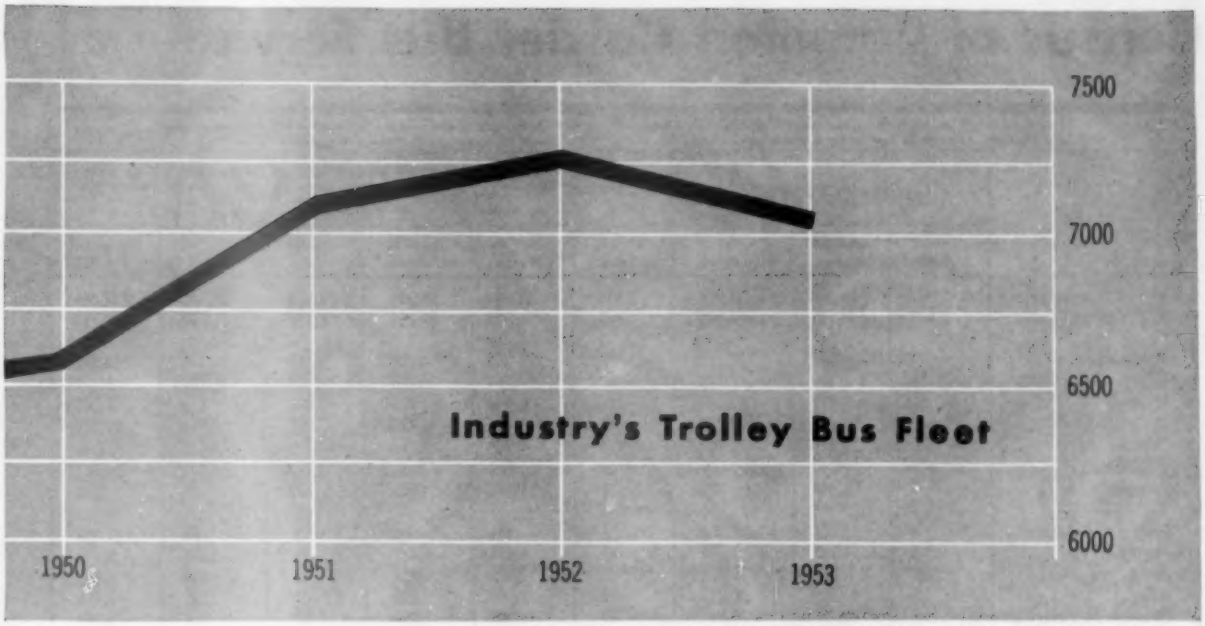
Trolley Bus

• FOR THE FIRST TIME in many years the physical size of trolley bus operations in the United States showed no gain in 1953.

As a matter of fact, total trolley buses owned and operated took a drop last year. This was due to the fact that no deliveries of new vehicles were made during the year, plus the scrapping of obsolescent vehicles.

The total number of trolley buses owned by domestic carriers as of December 31, 1953, came to 6,958. This compares to 7,170 trolley buses as of the same date in 1952.

Trolley buses owned in the United States and possessions, including the 100 owned by Honolulu Rapid Transit total 7,058.



BUSES, WITH NO REPLACEMENTS IN 1953, THE TROLLEY BUS FLEET DROPPED FOR THE FIRST TIME IN MANY YEARS.

Fleet Shows Losses in 1953

- **The nation's trolley bus fleet is down to 6,958 vehicles. Chicago Transit Authority, with 672 units, still remains largest fleet operator in the industry. Cleveland's transit system climbs to second place.**

Number of Carriers • The total number of domestic carriers operating trolley buses at the end of 1953 was 41, the same as 1952. This count lists the Duke Power Company operations in Greensboro, N. C., and Greenville, S. C., as two separate trolley bus operations.

Chicago Transit Authority, with 672 trolley buses, remained the largest fleet operator. Cleveland Transit System, with 461, was second.

The largest reduction in trolley bus operations during 1953 occurred at United Transit in Providence. This carrier had 229 vehicles at the end of 1952. At the end of 1953 it had 110 vehicles. Some of these were sold and some scrapped.

Cincinnati Transit was another carrier with a large reduction. This carrier sold 40 vehicles.

Several carriers picked up a number of second hand vehicles during 1953. Indianapolis Railways picked up 25, Dallas Railway 10, and MTA in Boston 16. Cleveland Transit added 50 on Jan. 1, 1953 which were purchased from United Transit in December, 1952.

With this addition, Cleveland wrested the second spot from Atlanta Transit. Johnstown Traction in Johnstown, Pa., which entered trolley bus operations in 1951 with six trolley buses, remained as the smallest carrier.

Atlanta Transit's fleet, in dropping to third spot, held at 453.

Future Orders • For the second consecutive year, Trolley bus carriers have not placed any orders for new vehicles. At the start of 1953, although no orders were in sight, manufacturers believed that a few carriers would place orders by the middle of the year. The year ended, however, with no new orders or deliveries of trolley buses.

For this year the situation appears to be the same. Not a single carrier has placed orders for new vehicles. Again, manufacturers are hoping that some orders will materialize within the next six months, particularly since the obsolescence factor as it applies to the existing trolley bus fleet is now larger than ever.

Census of Common Carrier Bus Service

The figures shown below give the number of companies having their operating headquarters in the states listed. All equipment and highway mileage of interstate companies are included in the state where such companies have their general offices.

STATE	GRAND TOTAL			DIVIDED ACCORDING TO TYPE OF SERVICE AS OF DECEMBER 31, 1952					
				Transit Operations			Intercity Operations (Short & Long Hauls)		
	No. of Cos.	No. of Buses	Miles of Highway	No. of Cos.	No. of Buses	Miles of Highway	No. of Cos.	No. of Buses	Miles of Highway
B. T. Estimated Total.	4,200	84,900	464,800	1,550	56,400	60,300	2,650	28,500	404,500
B. T. Census Total...	3,679	81,127	420,304	1,440	55,721	59,567	2,239	25,406	360,737
Alabama	100	1,037	12,221	13	560	1,230	87	477	10,991
Arizona	24	307	2,139	8	206	429	16	101	1,710
Arkansas	74	603	5,187	16	330	411	58	273	4,776
California.....	172	5,819	23,974	71	4,043	4,626	101	1,776	19,348
Colorado	22	487	2,394	8	365	316	14	122	2,078
Connecticut.....	43	1,327	2,870	25	1,203	1,795	18	124	1,075
Delaware	7	88	326	2	71	103	5	17	223
District of Columbia..	5	1,151	2,746	1	991	806	4	160	1,940
Florida	52	1,483	7,796	35	1,130	2,421	17	353	5,375
Georgia	84	1,081	10,014	23	621	1,482	61	460	8,532
Idaho.....	38	170	2,603	8	69	195	30	101	2,408
Illinois	119	4,785	9,281	67	4,309	3,389	52	476	5,892
Indiana	116	1,672	8,045	36	1,056	1,215	80	616	6,830
Iowa	51	682	5,393	21	504	651	30	178	4,742
Kansas.....	43	776	12,659	14	335	393	29	441	12,266
Kentucky	94	1,799	13,671	31	855	1,190	63	944	12,481
Louisiana.....	73	1,286	13,338	23	612	626	50	674	12,712
Maine	34	373	3,460	11	208	316	23	165	3,144
Maryland	68	1,313	4,704	15	773	875	53	540	3,829
Massachusetts.....	98	3,148	10,303	45	2,452	3,805	53	696	6,498
Michigan	87	3,658	12,440	40	2,791	2,025	47	867	10,415
Minnesota.....	62	1,720	19,160	30	955	967	32	765	18,193
Mississippi	52	436	3,121	14	303	564	38	133	2,557
Missouri	71	2,520	12,187	20	1,994	1,045	51	526	11,142
Montana	27	207	2,837	7	131	147	20	76	2,690
Nebraska	38	1,192	26,174	11	345	357	27	847	25,817
Nevada	14	87	2,511	3	29	127	11	58	2,384
New Hampshire	35	264	1,428	6	111	164	29	153	1,264
New Jersey.....	397	5,422	7,167	345	4,304	3,821	52	1,118	3,346
New Mexico.....	29	252	3,814	8	105	533	21	147	3,281
New York	212	9,396	11,062	98	8,427	4,529	114	969	6,533
North Carolina.....	115	1,816	15,045	34	796	1,626	81	1,020	13,419
North Dakota	19	103	2,361	3	62	63	16	41	2,298
Ohio	150	4,737	27,333	52	2,716	2,163	98	2,021	25,170
Oklahoma	27	823	10,160	14	419	566	13	404	9,594
Oregon.....	27	704	3,904	8	485	354	19	219	3,550
Pennsylvania	319	5,606	18,171	75	3,505	4,530	244	2,101	13,641
Rhode Island.....	16	542	2,543	4	269	284	12	273	2,259
South Carolina.....	30	369	2,665	15	225	556	15	144	2,109
South Dakota.....	18	169	5,986	8	88	147	10	81	5,839
Tennessee	108	1,513	9,453	18	833	1,412	90	680	8,041
Texas	119	3,912	29,683	38	2,304	2,480	81	1,608	27,203
Utah	27	343	2,282	6	216	323	21	127	1,959
Vermont	23	148	2,234	3	26	59	20	122	2,175
Virginia	93	1,888	7,147	29	1,317	1,415	64	571	5,732
Washington.....	71	1,254	7,496	25	722	1,213	46	532	6,283
West Virginia	82	1,353	12,895	17	534	916	65	819	11,979
Wisconsin.....	79	1,220	4,451	32	978	861	47	242	3,590
Wyoming	15	86	1,470	4	38	46	11	48	1,424

Note: In New Jersey, a number of individuals operate on the same routes in a pool. The pool operation is considered as a unit for miles of highway covered. However, each operator in the pool is counted as a single company.

What the Billion Dollar Bus Industry Spent in 1953

$535,000,000

Buses

3,807 common carrier motor buses produced in 1953 (3,446 domestic; 361 export); 15,548 school buses..... **$160,000,000**

Fuel & Lubricants

Gasoline, diesel fuel, LP gas, lubricating oil and greases..... **150,000,000**

Repair Parts

Replacement parts, accessories, maintenance materials and supplies..... **125,000,000**

Tires

Tires and tubes for bus industry fleets..... **50,000,000**

Buildings

New garages and shops, shop equipment and tools, new passenger terminals and building improvements..... **50,000,000**

Total Expenditures

Capital outlay and operating supplies of common carrier and non-common carrier bus operators. Taxes and labor excluded..... **$535,000,000**

Except as otherwise credited, all statistics in this issue were compiled by the statistical section of BUS TRANSPORTATION

UNITED TRANSIT'S "BEA" TALKS TO PEOPLE ON BUSES, ANSWERS QUESTIONS, SELLS THE EVERYDAY TRANSIT STORY

Winsome "Bea of the UTC" Sells Transit to Riders in Providence

By Douglas W. Cray

• UNITED TRANSIT'S PROGRESSIVE public relations program is putting its best . . . and most attractive . . . foot forward these days.

The attractiveness lies in the person of a bright young lady who is more than instrumental in helping UTC sell the transit story in Providence.

Her name is Jane Fraser. She's 21, Chicago-born, was graduated last spring from Pembroke College in Providence.

But to most of the residents of greater Providence, whether or not they're bus riders, she's known as "Bea of the UTC."

Sometimes she's referred to as the hostess of the UTC. This she sometimes is, but the term falls short of describing her work or its value to the company.

Out In Front • In a sense, Jane Fraser is a "front" for the company. She's somebody the public can see and talk to.

She rides the buses and talks to people. She roams the streets and avenues of the city and talks to more people. She answers questions, explains company operations and policies, receives and answers complaints; she talks before civic and fraternal groups, and is at her best before school groups.

Her photogenic countenance can be seen on television shows, and her pleasant voice can be heard on radio. Everywhere she goes, she tells the story of transit and the UTC.

She's one good reason why UTC's public relations program really clicks; why the people of Providence know more about the transit company and its problems today than ever before.

Television Debut • Jane Fraser's first appearance before the public was last February when UTC began its bold new venture in television (see BT, Oct., 1953, p.40).

The television show was President Arthur Lewis' idea. So was the television character known as "Bea."

But Lewis had a lot more than a TV spot in mind for Jane Fraser when she was introduced to local video fans. He visualized her as a full-time and important member of the public relations and business promotion department which is headed up by Bob Lynch. And that's exactly what she is today.

Jane has been brought along slowly. When she first took over the role of Bea on the company TV show, she knew no more about the transit business than the average bus rider. Today she talks easily and with increasing knowledge of the transit industry, what makes it tick . . . and what's wrong with it when it doesn't tick.

To back this up, she has acquired a solid working knowledge of the numerous departments within the UTC organization.

Smartly Attired • On the TV show, on the buses, in fact wherever she appears on company time, Bea wears a smart looking uniform.

(Let's settle this identity business: Lewis is the only one at UTC who calls her by her real name—Jane. To everyone else at UTC, and the community generally, she is known as Bea. So this story will henceforth call her Bea.)

Bea helped design her own uniform. It resembles an airline hostess' uniform and at first Bea was frequently taken for an airline, not a busline representative.

But, unlike the young ladies who hostess aloft, Bea serves neither dry martinis nor hot coffee to patrons of UTC. Her presence on a bus is not directly aimed at making any particular trip for any particular rider as pleasant and comfortable as possible.

Instead, Bea rides the buses to find out how the passengers are reacting to the service in general. She doesn't pry. But she's there, with a notebook and pencil, to listen to any complaints, answer specific questions about operations if she can.

If she does not know the answer to a question, she jots down the name and address of the questioner, gets the answer from someone in the company, and then dictates a personalized letter to the interested party.

Bea's role could be truly described as a kind of go-between for the company and its customers. During the course of her daily rounds she picks up a number of suggestions from riders concerned with improving the service. She is now capable of discussing these suggestions intelligently right on the spot. When they have real merit, she forwards them to deparment heads or directly to President Lewis.

Handling the Mail • At an ever increasing rate, letters from the public to the company, many complimentary, some critical, come addressed to Bea. At first, Public Relations Director Bob Lynch, or some other company officer, would help Bea draft a reply. Now, however, Bea handles most of this correspondence herself.

These letters are as good an indication as any other of how Bea, the TV show and the other phases of the transit company's public relations program are paying off.

There has been a decided drop in the number of sharply worded letters to the editor in the local press. Bea now gets these and the tone of the letters suggests that the public is gradually coming to understand a little more about the transit business.

More important, riders apparently are beginning to realize that UTC is actually trying hard to improve its service in the interests of efficient and adequate mass transportation in the community.

A Typical Day • As we indicated earlier, bus riding is just a part of Bea's job. Let's take a look at a somewhat typical day, and the varied assignments which she carries out.

On the day under review, she started the morning at 9 a.m. as a guest on a local television program. It was a sort of coffee hour interview designed for the distaff side of the video audience. A mistress of ceremonies conducted the interview in such a way that Bea was able to talk about her job with UTC, and how the company was planning to improve its off-peak service for shopping housewives.

After the TV program, Bea hopped out to make two trips on the Pawtucket line to check on how a new fare system was working out.

Following a quick lunch snack, she joined Bob Lynch for a talk before the North Providence High School assembly. They showed the film "Going Places."

From this assignment, Bea went to the film studio where the weekly UTC television show is put together on film. She was before the television cameras for more than an hour while that day's quota of "takes" was filmed.

After dinner, Bea changed from her day uniform to a more formal type of evening uniform. She joined Bob Lynch in an appearance before a meeting of the Fairlawn Community Associates. This group has long been seeking an extension of a bus line to Fairlawn Street.

Between them, Bob and Bea explained the economics involved in transit route extensions into thinly populated areas. After their talk, greater understanding prevailed. Individuals in the Fairlawn group still wanted transit service on their street, but at least they now understood why the company could not provide such service at the present time.

Bright, New Idea • On days less crowded with outside appointments, Bea rides more buses, talks with more people, and spends a certain amount of time each day dictating replies to the ever-increasing volume of mail which comes to the transit company addressed directly to her.

Bea is popular with the public, and with the transit company. She's a winsome and intelligent salesman of UTC and of transit generally, and an important adjunct to Bob Lynch's public relations staff.

President Lewis's faith in an idea has been vindicated. It was a bright, new idea that has clicked.

Lowell H. Brown

Former New York State Senator believes...

Transit Tax Exemption

An expert presents facts and figures to prove that tax exemption for transit can save $240,000,000 a year by 1963

EDITOR'S NOTE • *As the financial position of the transit industry becomes worse and worse, it is becoming evident that there is a need for entirely new relationships between transit operators and governing bodies.*

This is so because transit is a vital industry whose primary purpose is to serve the people. The people, therefore, must take steps to aid transit, or be prepared to take it over themselves and pay the enormous costs which public ownership entails.

In this article Lowell H. Brown, who has spent years studying the transit industry, presents one method of preserving transit as a private enterprise. His arguments, and the facts and figures to support them, are the same ones he presented recently to the New York Metropolitan Transit Commission.

• EXEMPTING PRIVATE TRANSIT CARRIERS from taxation wouldn't cost the people of the United States one penny. It would actually save them hundreds of millions of dollars a year in governmental costs.

The figures which I use to prove this are based on average financial reports of transit carriers, public and private, throughout the nation. They show clearly how tax exemption for private carriers can save money for everybody and halt the rush toward government ownership of transit systems.

That trend is, in itself, one of the most serious problems facing us. My figures show that right now there are about 20,000 municipally-owned buses in operation in the United States.

But a thorough study of the industry also reveals that by 1963, if present tax and regulation policies continue, that number will have doubled and we will have 40,000 city-owned buses.

That will mean a tremendous cost to the taxpayers. It's a cost they need not pay, because . . .

Facts and figures show tax exemption is real economy

FACT 1: Every city-owned bus on the road costs the people—through national, state and city governments, about $6,000 a year to operate.

$1500 operating loss
2355 debt service
1400 taxes - each private bus
750 avg. depreciation undercharge
$6005 yearly loss to public

FACT 2: There are now approximately 20,000 city-owned buses in operation, making the total loss to the public about $120,000,000 a year.

$6000 loss per bus
× 20000 buses
$120,000,000 total loss per yr

FACT 3: Since a study of the industry shows that, unless tax and regulatory policies are changed, there will be 20,000 more city-owned buses by 1953, the loss to the public by then will be about $240,000,000 a year.

$6000 loss per bus
× 40000 buses
$240,000,000 loss per yr by 1963

FACT 4: By exempting private carriers from taxation, national, state and city governments would lose $53,200,000 a year.

$1400 taxes per bus
× 38000 private buses
$53,200,000 private taxes not paid

Will Save the Public Millions

FACT 5: In spite of this revenue loss, the three governments would actually save $186,800,000 a year if they grant tax exemption and return city-owned lines to private ownership.

$240,000,000 yearly loss by 1963
-53,200,000 private carrier taxes
$186,800,000 savings per year

The figures used have been on the conservative side, as a glance at comparable figures for New York City will quickly show (see box).

But even discounting New York, the figures still represent only the lowest possible savings which would be realized through tax exemption for private carriers.

For instance, I have stated that by 1963 an additional 20,000 buses would be publicly-owned. That is true. But my figures, to be on the safe side, don't take into account the fact that by 1963 there will be fewer privately-owned buses than at present . . . unless this current trend toward government ownership is halted.

This means that private operators, with fewer buses, will pay far less than $53 million in taxes. Let's say, for example, that they pay only $25 million.

The government then has less to lose and more to gain by exempting them from taxation. And the resultant saving for the people, instead of $186 million, totals about $215 million a year!

I know, of course, that it would be impractical and unfair to exempt carriers from every tax they now pay. My position is this:

N. Y. story shows figures are low

• *In New York City I have figured the average loss per city-owned bus at $11,334:*

$ 4,656 operating loss
2,700 private bus taxes
2,355 debt service
1,623 depreciation undercharge
$11,334 loss per year

The city now operates approximately 2,000 buses, but it may be necessary for it to acquire another 1,000 Third Ave. Transit Corp. buses, plus an additional 500 vehicles, by 1963.

If that happens, losses to the federal, state and city governments would be $39.7 million a year.

Tax exemption for the city's 2,900 privately-owned buses would lose $7.83 million a year in revenue . . . would save $39.7 million a year by 1963.

Private carriers should pay only 'welfare' type taxes

Other industries simply pass on taxes to consumers in the form of higher prices. Transit is not allowed to do that . . . government regulation prevents it.

Transit is now saddled with franchise and gross receipts taxes, fuel taxes, income and sales taxes, city and state utility taxes, and many others.

They are all levied on a service which is vital to the public. Private carriers should not pay them!

It's perfectly reasonable that they pay those taxes which fall in the general category of "social security." The health, welfare and security of its employees are the concern of the company and the employees. They benefit from these taxes, and they should pay them.

In any discussion of tax exemption there are always certain questions which arise. On the following page are those asked most frequently, and their answers:

How can the public be sold on the idea of tax exemption for private transit carriers?

Strictly from the standpoint of advantage to the people themselves!

They would receive better service at no increase in fares since, like all successful businessmen, transit operators would have to put most of the profits back into the business.

It would be easy to convince the lower income groups —chief users of transit—that they will be the ones to benefit by improved service, stable fares and lower tax rates.

Why won't the new 'authority' system work for transit as it has in certain other fields?

There is no comparison between transit and other fields in which public authorities have worked brilliantly. Two outstanding groups which come to mind are the Port of New York Authority and the New Jersey Turnpike Authority.

But these facts must be remembered:

1. Both these authorities have monopolies in their fields. Transit does not.

2. In both cases the ratio of labor costs to revenues is so low as to be almost negligible. Transit's labor cost is by far its largest expense.

3. Neither authority must maintain and service the millions of vehicles that use its facilities. Transit operators must spend a large part of their income on maintenance.

The entire authority theory is based on the assumptions that if an operation is taken out of the direct field of politics deficits will disappear . . . but that if they do occur the authority will meet them without additional taxation.

Both assumptions are false! By its very nature, as proven by operating reports throughout the country, any government-run operation is more extravagant than private operation . . . and regardless of legal provisions to the contrary, there is only one source from which authority deficits can be made up—the pockets of the taxpayers!

How can tax exemption bring about return of city-owned systems to private ownership?

1. Tax exemption for private carriers would cause a rise in ratio of net income to operating revenue from 1.2 per cent to about 11 per cent.

2. Corporations with a ratio above 10 per cent are held in high esteem by investors.

3. It would be easy to find these investors, since cities could make unusually attractive sales offers. They are selling something they don't want . . . something which costs them money. Even if they gave the lines away absolutely free they would still be ahead financially.

In fact, my figures show that in the case of New York City the people would be saving $22.7 million a year right now if the city had given its lines to private operators at no cost whatsoever!

Why should rural areas agree to legislation which seems aimed mainly at helping cities?

The people and legislators of rural areas must be shown that tax exemption for transit carriers will benefit them directly.

They now help pay for publicly-owned transit through their taxes, although they never use it. If the transit systems in their big cities are privately-owned, tax exemption will insure that they stay that way, and don't become a tax burden on the entire state.

Furthermore, when the states no longer have to support public transit operations, it will release millions of dollars of state money for grants-in-aid, most of which would benefit rural areas.

Can tax exemption for private carriers be legally granted by state legislatures?

The answer is yes—in most states!

My study of the New York State Constitution and of the constitutions of other states convinces me that there is a simple way of granting exemption without amending the state constitutions.

All that is necessary is to pass a general law, applicable to cities above a specified population, exempting transit carriers in those cities from taxes.

The law then is aimed at benefiting all the people . . . and only incidentally the transit carriers who serve the people.

Conclusion: we need tax exemption now . . . it's the only way to save a vital industry

I have shown that exempting private carriers from taxation would save the people hundreds of millions of dollars a year, and that it can be done—both legally and politically.

Now is the time to do it—before our cities are forced to take over their own transit systems.

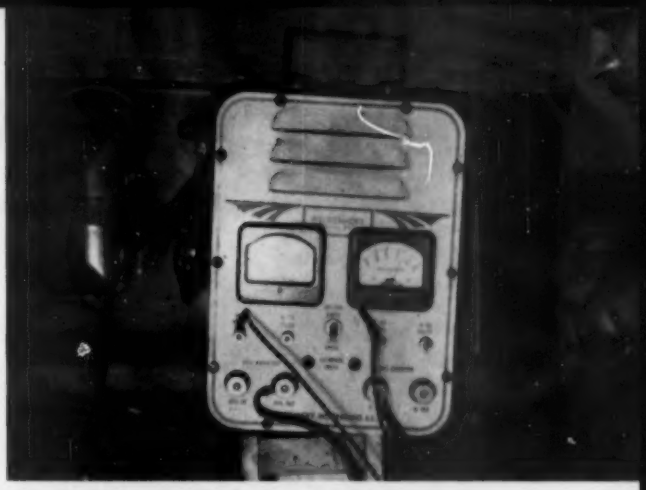
For in spite of the vital service that private transit operators provide, it is as if the governments said to them:

"We have charged you with the basic duty of providing even better and larger services to the end that the public will be served and that business and real estate values in our city will grow.

"But we will limit the rates of fare you can charge, we will force you to supply unnecessary service and to extend your lines into unprofitable territories, and we will take away from you each year the amounts over operating expenses which you will need to fulfill the duties with which we have charged you."

It's obvious that transit cannot survive as a private industry under these conditions.

For the good of all the people transit needs tax exemption . . . and it needs it now!



CAREFUL CHECKS are made to guarantee fully charged batteries. Thermometer (left) reads 72 deg at room temperature . . . hydrometer shows specific gravity of 1.245. Readings are corrected to 80 deg. Voltmeter (right) checks charging rate.

Bluebird Reduces Battery Costs

By Harold A. Grenert*

• THE ELECTRICAL MAINTENANCE PROGRAM of Bluebird Coach Lines is based on the premise that no two identical electrical components behave the same way.

This is true of engines, and Bluebird believes it true of other components too. The company has proved it to its financial satisfaction by slashing battery costs and cutting light bulb costs in half.

From experience Bluebird found that electrical troubles are minimized if the specific gravity of a battery is between 1.245 and 1.255—a rate which prevents over- and under-charging. This differs slightly from the usual 1.280 or 1.300.

Mechanics take battery readings weekly. With the aid of a thermometer, readings are corrected to 80 deg and adjustments to the correct level are made.

The Why • Since Bluebird's 80 buses are pressed into transit, intercity and suburban service, it was found that a standard regulator setting would result in over-charging one day and under-charging the next. Depending on service, operating speeds range from 15 to 50 mph . . . stops from two to 15 a mile.

Electrical equipment on the buses consists of 160 and 204 amp hr batteries, low and high cut-in generators and alternators. It's obvious that a standard voltage regulating setting for all vehicles would be impractical. It also is obvious that the answer is to find the exact voltage setting for each bus.

After arriving at the best charge level for the fleet, Bluebird sets about checking its buses to bring them in line. After several weeks of testing, mechanics can tell the state of charge of a battery.

Then it is a simple matter to adjust the regulator.

Regulators putting batteries above the 1.255 mark are dropped in steps of 0.2 volts . . . stepped up at the same rate if specific gravity drops below 1.245.

All readings are taken at 80 deg or are corrected to that figure. Normal battery operating temperatures range from 77 to 80 deg, but for every five deg higher than 80, two points (0.002) are added . . . five deg lower and two points are subtracted from the reading.

What It's Done • Simple though the plan is, it has produced savings—battery costs have shrunk.

The average life of a battery before the plan was started was 30 months. It increased to 38 months and is still climbing. What the ultimate saving will be can't be known until the entire fleet is equipped with new batteries and can be serviced according to the present check-up. But, it is known that. . .

Bluebird spent $2,400 for batteries in 1951 . . . only $1,920 in '52 with the plan in operation only part of the year. During the first six months of 1953 battery costs were negligible. Final figures are expected to show a 50 per cent saving over 1951.

On the basis of these savings alone the plan is a huge success, but that's not all. Bluebird realized a further saving in the cost of light bulb replacement.

Not only were expenditures for bulbs halved, but labor costs of replacing them were cut 50 per cent too. Often the cost of labor exceeds the bulb cost.

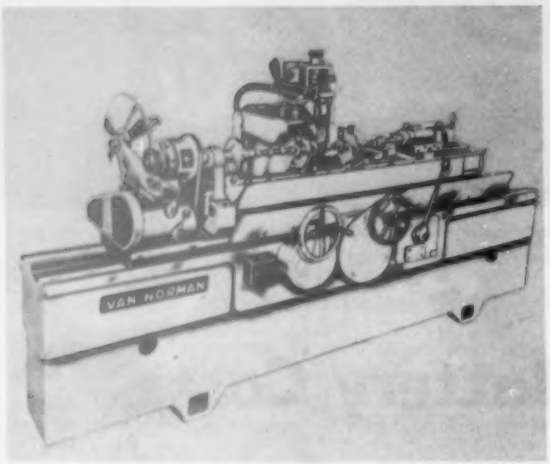
As a direct result of Bluebird's carefully executed electrical program, purchases of spark plugs and ignition contact points dropped 34 per cent below 1951.

Significant perhaps of the new system is that the batteries require water only once every five weeks. Before they needed water each week. But no saving in labor results. The time needed to take hydrometer and temperature readings offsets any such saving.

Although fine for Bluebird, the specific gravity of 1.245 may be too low for operators in northern cities who store their buses outside. In sub-zero weather the minimum specific gravity might have to be raised, but it shouldn't exceed 1.260.

* *Mr. Grenert was in charge of maintenance at Bluebird when he developed this article. He has since become maintenance chief for the Green Line in Covington, Ky.*

WHAT'S NEW



New Camshaft Grinder Is Now Available

A new Van Norman camshaft grinder, designated as the No. 253, has been placed on the market.

This new grinder, according to the manufacturer, is a heavy-duty machine that has the weight, speed and rigidity to do fast, accurate, dependable work and at the same time save money for operators because of its efficiency and reliability.

The No. 253 grinder measures 52 in between centers, but, according to the manufacturer, will handle 100-in camshafts simply by reversing the shaft. The maximum diameter it will handle is nine inches.

Another feature of the new grinder, the manufacturer says, is that there are four workhead speeds: 25, 50, 100 and 200 rpm.

Additional information on the Van Norman No. 253 camshaft grinder can be obtained by writing to the *Van Norman Company, Springfield, Mass.*

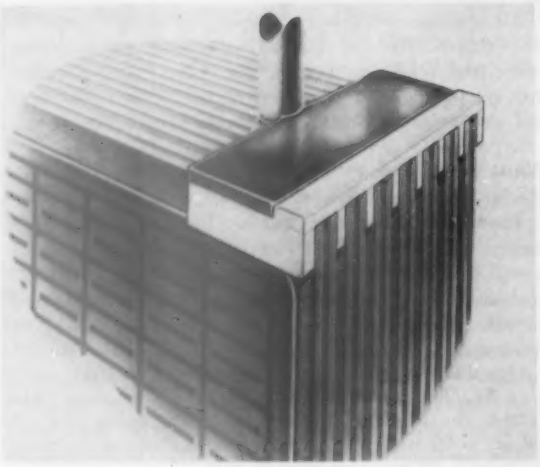
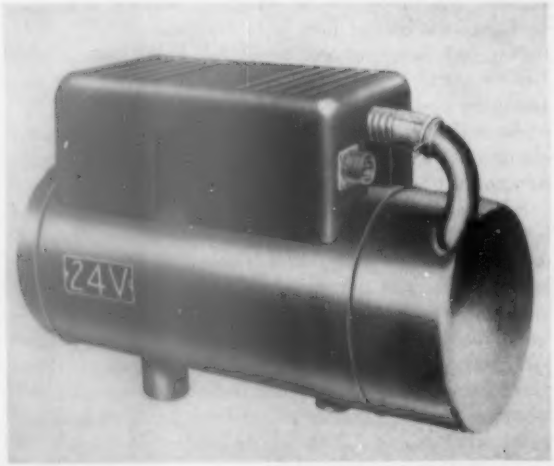


Plate Anchor Is Key Battery Feature

A new line of heavy-duty batteries said to offer greater power, longer life and dependability has been introduced by Willard Storage Battery Co.

According to the manufacturer, the new battery line means a great reduction in lost time required for battery servicing, and more than doubled battery life expectancy. A key feature of the new battery is an exclusive plate anchor said to hold plates firmly in place, thereby stopping severe internal plate vibration and protecting plates from premature failure. Willard rubber insulation is said to outlast the battery plates, give increased and equalized support, eliminate shorts, and resist premature plate buckling and deformities.

Additional information on the new line can be obtained by writing to the *Willard Storage Battery Company, Cleveland, Ohio.*



Combustion-Type Engine Coolant Heater

A new combustion-type engine coolant heater, model 939-A, has recently been added to the large line of hot air combustion-type heaters manufactured by the South Wind division of Stewart-Warner.

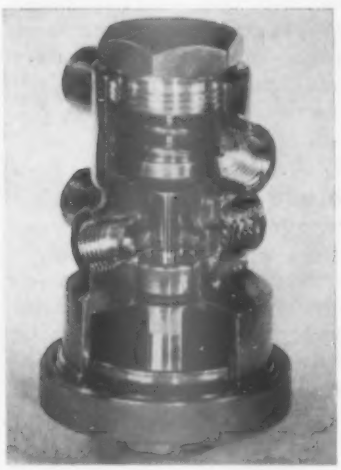
The new heater is said to be extremely small in size and delivers 15,000 Btu/hr to the engine coolant. Six thousand Btu/hr from the heater exhaust are available for other uses.

This heater, which is approximately 6 in in diameter and only 15¼ in long, is said to be designed so that it may be mounted either horizontally or vertically, and to operate satisfactorily on a moving vehicle. As an engine preheater, or for standby engine heating, it offers the advantage of maintaining a constant coolant temperature by cycling automatically between high and low heat. *South Wind division of Stewart-Warner Corporation, Indianapolis, Ind.*

New Anchor Tip For Trolley Coach Overhead

A new longer tongue-end anchor tip for trolley coach overhead has been developed. The new tip permits a three-inch plug of free wire to be inserted at the pan end, making possible savings on wire and splicers and prolonging the life of the tip itself.

When a frog or crossover pan adjacent to the tip is replaced, the 3 in plug of free wire is also replaced — the new pan and wire forming a smooth underrun. For additional information write *Ohio Brass Company, Mansfield, Ohio.*



New Automatic Drain Valve Is Now Available

A new automatic drain valve designed to eliminate manual operation in the draining of air compressor systems on buses is now available. It is said to automatically eject harmful deposits of water, oil and sludge from air receivers and lines at frequent and regular cycles, keeping the air receiver bone-dry.

The new valve is also said to be completely fool-proof in operation, and will not freeze or gum up in sub-zero weather. *Graham-White Mfg. Co., Salem, Va.*

A New Design In Wedg-Head Wrench

A new Wedg-Head wrench that is said to fit into tight corners, against walls and over obstructions where sockets, box wrenches and other ordinary open ends can't reach is now available. Because the head is angled, the Wedg-Head takes solid bites on thin square or hex shaped nuts and permits the wrench to clear obstructions without skinning knuckles. A hollow dome inside the head gives full jaw grip at all angles. For complete information write *Blackhawk Mfg. Company, Milwaukee, Wisc.*

Here are some other NEW PRODUCTS that are described more fully in another part of this issue. Don't miss them . . .

- **Detachable Air Coupler** — said to offer 35 per cent greater air flow, yet weighs only 4½ ounces.....p. 135
- **All-Purpose Vise**—that is said to work equally well in any upright or on-its-side position.....p. 136
- **Vehicular Public Address System**—employing no tubes, vibrators, or other fragile components.....p. 137
- **Bumper Towing Chain**—for use on all types of light vehicles.....p. 139
- **Pull Clamp Attachment** — provides lighter, faster, more compact pulling assemblies for body repair .....p. 140
- **Safety Device**—a simple device for protecting the operator when inflating vehicle tires.....p. 141
- **Thread Insert Line** — for use in the repair of worn and damaged threads in automotive equipment.....p. 142

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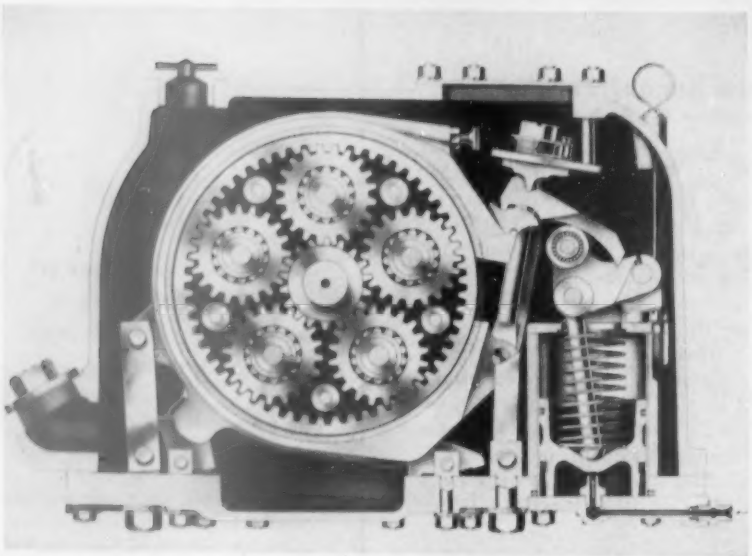


SECTIONAL VIEW of the pneumo-cyclic gearbox showing brake band operation mechanism and piston actuating arrangement. Bottom right-hand corner shows restrictor valve.

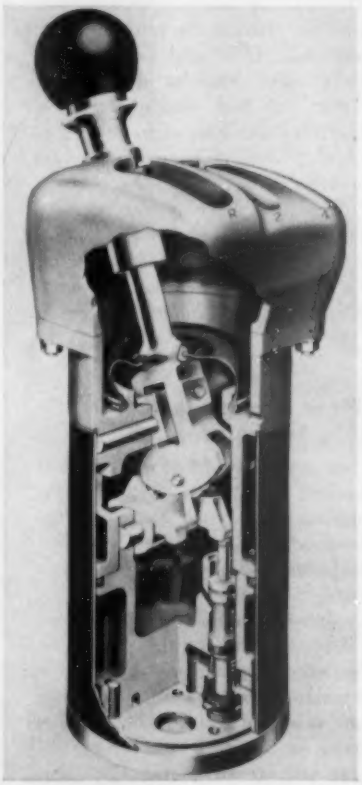
Two Pedal Control For Buses

A new system of driving controls for buses, consisting of two pedals—an accelerator pedal and a brake pedal—has recently been announced. This system, which dispenses with a clutch pedal, employs a pneumo-cyclic gearbox. According to the manufacturer, the new gearbox is designed to work in conjunction with a fluid flywheel that will reduce the fatigue and strain of bus drivers considerably.

It is claimed that gear changing with the pneumo-cyclic gearbox becomes almost automatic. The driver merely flicks a miniature change speed lever into the gear desired, and the pneumo-cyclic gearbox with its patented control does the rest. No pedal movement and preselection of gears is necessary.

Another road-safety factor incorporated in the pneumo-cyclic gearbox is a hill-holding device. When any forward gear is engaged it is said to be impossible for the vehicle to run backwards, even though the brakes are off and the engine is idling. Detailed information on the new system can be obtained by writing to *Leyland Motors Limited, Leyland, Lancashire, England.*

Continued on page 135



GEAR CHANGE control unit used in conjunction with the pneumo-cyclic gearbox.

New Literature

The following have been selected as particularly worthy of your attention, and condensed for your convenience.

Fare Receipt Bulletin

A meter system of registering riders has recently been described in a bulletin, which tell how this automatic meter system can impersonally count all passengers.

According to the manufacturer, the turnstile-type meter will automatically register the passengers as a check against the fares turned in. Additional information in the bulletin includes the physical characteristics of the rider meter, the helpful effect on bus operators, and how it betters carrying-capacity and orderly movements of passengers in the bus. *Perey Turnstile Co., 101 Park Ave., N. Y.*

Ice and Snow Remover Catalog

A new catalog sheet on Melt chemical ice and snow remover has recently been announced. The catalog describes Melt as a fast-acting ice and snow melting chemical in pellet form. Illustrated with line sketches, the bulletin recommends Melt for use in de-icing drains, gutters and for removing hazardous ice on loading docks, sidewalks, drives and parking lots. Additional information can be obtained by writing *The Chem Industrial Company, 3784 Ridge Road, Brooklyn 9, Ohio*

Reconditioning Bulletin

A bulletin describing a new, low cost method of repairing and reconditioning Spicer model 916 torque converter planetary pinion spiders has recently been announced.

The repair operation is said to restore thrust pads to original tolerances and provide for installation of tab washer flats on old models. Bulletin copies may be secured from *Trans-Main Corp., Kent, Ohio*

SHORT HAULS

AFRICAN CON GAME—A gypping Egyptian landed in a Cairo jail for selling a street car to a visiting country boy for $233 down and the balance, $330, in easy monthly payments. When the police caught up with the roving swindler they discovered he once made a habit of wearing police dress and searching villagers coming to Cairo . . . picking their pockets in the process. Maybe he can sell the jail he's going to be in for the next 101 years.

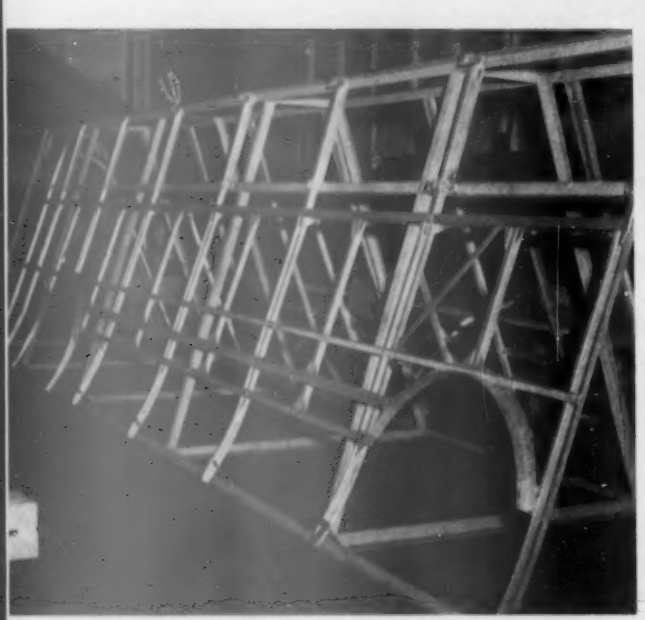
THAT ALARM IS A FARE BOX—A sleepy woman took an early morning bus to work . . . immediately fell asleep again and rode twice to the end of the line in Enid, Oklahoma. The driver finally woke her up and collected the full fare—for both trips.

THE HOT AIR SYSTEM WORKS TOO—V. L. Savkin, new Soviet man of the week, was featured on the front page of the official Soviet government newspaper. Savkin has driven a bus for eight years and 310,500 miles without an overhaul. The mighty Russian saved the government not only $62,500 in repair bills, but 4,500 gallons of gasoline as well. Of course, the story didn't say what condition the bus was in.

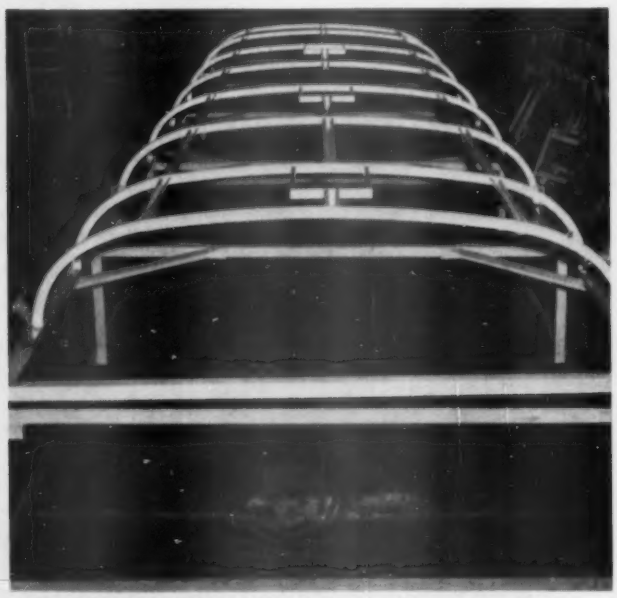
THE CAT HAD THEIR TONGUES—Kindergarten pupils in Berlin, Connecticut, wear name tags now because they are too bashful to tell the driver where they live. The driver used to spend two hours getting the youngsters home because they wouldn't tell him who got off where.

ANOTHER PARKING PROBLEM BITES THE DUST—There's no fooling around about parking in Appalachia, Va.—population 2,915. The parking problem there got so bad the town fathers passed a new ordinance prohibiting parking on any street for more than ten days at a time.

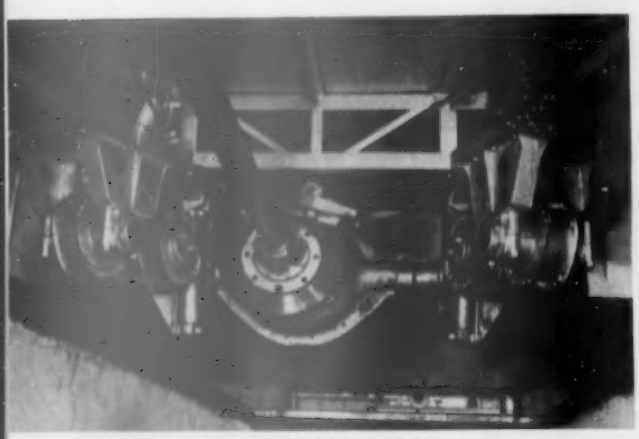
ENGLAND'S NEW LIGHTWEIGHT BUS, Model S 14 built by Birmingham and Midland Omnibus, will soon make its appearance on the road. The firm will build 270 in the next few months.



JIG-ASSEMBLED SIDE MEMBERS of 18-gage square tubing and channel rail are dovetailed at waist level to make side framing.



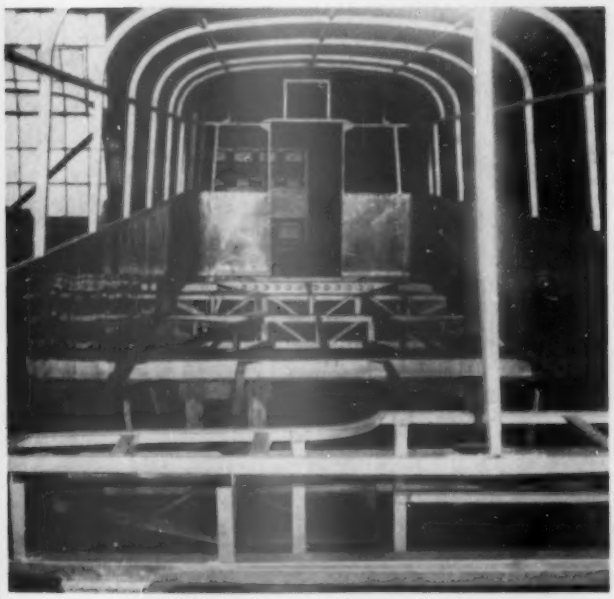
ROOF CROSSMEMBERS and longitudinal members are made up on jigs as a complete unit . . . later joined to the side framing.



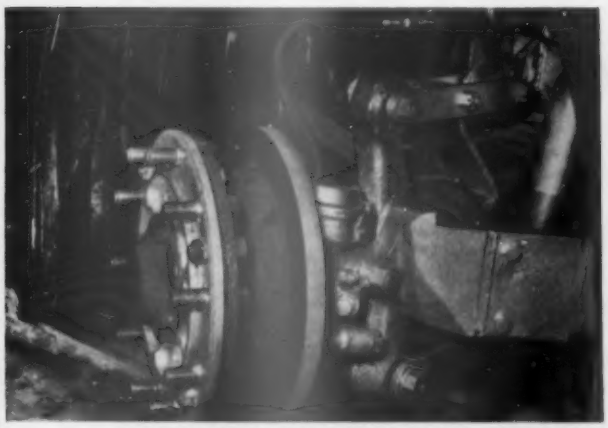
TRANSMISSION DISK BRAKE works directly on drive line . . . makes parts replacement easier. Suspension member is also seen.

INDEPENDENT FRONT WHEEL SUSPENSION, seen from below, uses a Metalastik development of rubber bonded to metal.

INTERIOR LINING of the S 14 serves as a stressed member. Vehicle is built to Transport Ministry standards.



ALL STRUCTURAL PARTS are steel. Underframe's latticed cross-members carry front and rear spring suspensions.



DISK TYPE WHEEL BRAKES are operated hydraulically by continuous flow servo unit mounted on top of the kingpin.

Great Britain Introduces New Lightweight Bus

• BRITISH BUS BUILDERS have what looks like the new lightweight champ in their corner—the steel and light alloy S 14, newest entry of the Birmingham and Midland Motor Omnibus Co., Ltd. The bus weighs in at 11,172 lb.

But the S 14 is no midget in the load carrying department. It seats 44, while it weighs only three-quarters as much as American buses of the same size.

The new Model S 14 incorporates the best features of two earlier ones tried out by the Birmingham firm. After World War II it experimented with an all-steel model, and then with a bus constructed entirely of a light alloy. These two have already clocked a total of 270,000 miles in successful experiments.

Combination of the Best • The new lightweight seems to have hit everyone's fancy. It combines the strength of steel and the lightness of alloys. Steel is used for framing components, while the inner lining, outer panels and doors are of alloy to keep the weight down. The S 14 is most popular with its manufacturer—Birmingham plans to build 270 of them in the next few months.

The buses are to be 30 feet long and eight feet wide —conforming to British Transport Ministry standards.

Model S 14 is powered by a six cylinder diesel which has a rated horsepower of 100 at 1,750 rpm, and which develops 350 ft lb torque at 1,100 rpm.

Brakes and Suspension Different • Perhaps where designers of the S 14 have diverged from the conventional most widely is in the development of the brakes and suspension. Wheel brakes are disk type operated through a continuous flow hydraulic servo unit.

In the springing of the vehicle, rubber is used all around. The front wheels are independently sprung and employ a Metalastik development of rubber bonded to metal with the rubber operating in shear and compression. Each front spring is formed by two units of circular section joined end to end by a metal plate. One end of the plate hinges in the upper suspension link to prevent the spring from buckling under compression.

Each unit is built of three layers of rubber bonded to metal plates. The end plates are drilled to take the anchor bolts. The outer ends of the springs are located on the stub axle swivel standard, and inner ends are mounted on brackets secured to the underframe.

HOWJADOITS

VISUAL WARNING (upper left) shines with a clear yellow light as a signal that the bus is about to turn. Audible warning, buzzer (in battery compartment), is loud enough to be heard over the din of heavy traffic. Relay and flasher are located above buzzer.

Light and Bell Cut Accidents

By Willard Beaurline, President
Bluebird System Coach Lines • Lyons, Ill.

• PEDESTRIANS ARE PROTECTED from walking into the sides of buses making right turns by flashing lights and buzzers installed on buses of the Bluebird System Coach Lines, Lyons, Ill.

Since the warning device has been installed there has not been a single collision between a bus and a pedestrian, according to Willard Beaurline, president of the company and inventor of the idea to save pedestrians and high claims costs.

Two yellow clearance lights mounted at the bus mid-section just above the belt rail make up the visual part of the warning system. They're hooked up with a flasher unit, relay and buzzer . . . are operated by a toggle switch mounted on the instrument panel at the driver's right.

When the switch is thrown as the bus is about to make a right turn in traffic, the yellow lights flash and the buzzer gives out an audible signal loud enough to overshadow ordinary traffic noise and warn all pedestrians that the bus is turning.

Inclined Floor Ends Gas Hazard

By H. Feldman, Supv. Auto. Maint.
Capital Transit Co. • Washington, D.C.

• BY SIMPLY BUILDING UP the garage floor next to its gasoline pump, Capital Transit Co. of Washington, D. C., put an end to a hot weather fuel hazard.

Capital constructed a four-inch incline to tilt its buses slightly to the right when filling them with gas. This crown gives buses enough tilt to leave a five per cent cavity in the gas tank.

Formerly Capital Transit had trouble when gas attendants pumped fuel right into the filler neck. With no room for expansion, the gas tank would spill fuel onto the garage floor. Obviously a fire hazard.

Now attendants can fill tanks to the brim, but when buses are brought back to an even keel the unfilled space gives the gas plenty of room to expand—even in the hottest weather.

Aluminum Siding Dresses Old Buses

Used by Missouri Pacific Bus Lines
Brownsville, Texas, Shop

• KEEPING BUSES looking like new presents less of a problem to Missouri Pacific Bus Lines since they started "face lifting" their older models with extruded aluminum strips.

Using semi-portable tools—a Delta radial saw and metal-cutting bandsaw—Missouri-Pacific has been able to keep time and costs of the modernization to a minimum.

Aluminum alloy strips are angle cut and riveted to the sides of the bus . . . give vehicles same look as new silversides coaches.

THE CONSULTING DEPARTMENT

A question and answer department devoted to industry maintenance problems

• This department is designed to assist readers seeking expert opinion on some particularly knotty maintenance problems. Here are some recent reader opinions on . . .

Front End Geometry

QUESTION • What practices do others follow in the inspection and correction of front-end troubles? We use a "stick gage" and set front wheel toe-in at from zero to 1/16 in. Are we wrong? Should we set alignment with a weegee board and thus compensate for variation in king-pin wear, caster, camber, etc.? Does wheel-balancing pay, particularly on buses which operate in city and interurban service?

ANSWERS . . .

Sympathy Plus Advice • "We have considerable sympathy for this property which is "up to its neck" in front end geometry problems. We had the same 'disease' and it took quite a while to get straightened out to a point where our tire mileage at least is now average.

"We experienced front tire cupping to such extent that the tires were removed and placed on rear wheels. In this position rapid wear occurred until the cupping was smoothed out. Obviously, this resulted in very poor mileage on our casings. We installed a weegee and experimented with it. Considerable time was spent in checking and rechecking with this device. Inasmuch as the toe-in readings varied from one day to another, we finally went back to our built-in type of front wheel aligning equipment and adhered closely to the manufacturer's specifications. Special attention was given to the king pins and to tie-rod ends to insure against lost motion. At the same time we checked the centering of the steering gear and sector to assure that there was no lost motion in straight ahead driving.

"Our tire supplier was very unhappy with our tire mileage, and so were we. Finally, we were supplied with a so-called directional tire with a series of circumferential grooves for front end use. This helped considerably in improving mileage but we still continued to have complaints from operators on hard steering, road fighting and other operational complaints.

"At this point, we purchased a 'Bull's Eye' wheel balancer and went over our fleet very thoroughly. This helped improve the general mileage picture. Another thing we did was to make certain that front wheel brake drums were concentric with the wheels. In a number of instances it was found that out of balance drums created gouges in the tires and a heavy thump developed in the wheels.

"By dint of the things we have done to insure proper front wheel operation we have been able to gain about 20,000 miles per tire. Our tire average at present is 60,000 miles."—*W. H. Head, Automotive Supt., Public Service Co. of New Hampshire, Manchester, N. H.*

"Come Up and See Us" • This is the invitation extended by the newly promoted assistant general manager of The Connecticut Co., Alden H. Williams, to the person who submitted this question. Mr. Williams continues with this:

"I doubt if this question can be answered adequately by letter so why not give our name and address to the person who submitted this question and invite him to come up and spend a day with us.

"Regarding the use of a 'stick gage' vs 'weegee' boards, I have not found any two people agreeing on which is better. Personally, I prefer 'weegee' while our tire supplier prefers 'stick gages' so we use both. If readings do not agree, we recheck to find out where the trouble lies. On our equipment, toe-in is set at from zero to 1/16 in.

"Until a year ago, I was much opposed to wheel balancing for buses in city service. It now is my opinion that front wheel balancing has done more to improve our tire mileage than any other single thing. For more than a year we have been putting our hubs, wheels and drums in balance so that we do not have to use balance weights. This because we alternate front tires every 6,000 miles. Tires are inspected every 3,000 miles for unusual wear patterns and our tire supplier's service men spot check once a month." *A. H. Williams, assistant general manager, The Connecticut Co., New Haven, Conn.*

Favors Balancing • "We find the telescoping rod a very satisfactory instrument for setting toe-in. We have 105 GM buses and on these we set toe-in at ⅛ inch. We have no special problem so far as caster and camber is concerned. King pins are checked every 4,000 miles and if necessary pins are rebushed if wear is indicated.

"In our opinion, wheel balancing definitely does pay. We use the Bull's Eye balancing equipment which provides a quick, simple and accurate means of checking. Our fleet tire mileage is 98,000." *Carl F. Richenberg, Supt. Maint. Buffalo Transit Co., Inc.*

No Advantage in Balancing • "We check front wheel alignment at each 3,000-mile inspection and maintain toe-in at from 1/16 to ⅛ in. at all times. Caster, camber and king-pin inclination is checked at each 15,000-mile inspection and corrections made if necessary. We use Bear aligning equipment.

"Regarding wheel balancing we decided after making tests on our suburban lines against our city lines that there is no advantage in balancing wheels on our type of operation. Our fleet tire average is 64,000 miles on

the original tread. We do not use recaps."—*J. N. Herring, Supt. Eqpt., Savannah Transit Co.*

100,000 Miles Per Tire • "We use the 'stick gage' and set all front wheels with 1/16 to ⅛ in. toe-in. In nearly all cases we are of the opinion that this is all that is necessary for city and suburban coach operation. We tried the 'weegee' board but failed to obtain satisfactory results and reverted to the 'stick gage.' We depend entirely on our regular inspection to uncover any indications of king-pin wear.

"Wheel balancing may be worthwhile on over-the-road equipment, but for city and suburban operations we do not believe that balancing will produce any substantial savings. A prime reason for this belief is the mileage we are getting from tires, notably an average for the past six months of over 100,000 miles per tire. I doubt whether this could be upped by spending more money on aligning the front ends or balancing wheels."—*R. H. Moore, Supt. Eqpt. Conestoga Transportation Co., Lancaster, Pa.*

Balances All Front Wheels • "Setting the front wheel toe-in at from zero to 1/16 in. is an average adjustment for the front wheels of present-day equipment. However, it is our recommendation to follow the manufacturer's specifications at all times and in event of trouble, contact the manufacturer for advice.

"As between the two types of equipment, it is our opinion that machine gages are much more accurate than 'stick gages' because with the latter the human element is such an important factor.

"We balance all front wheels and from experience know that not only does it improve steering but also eliminates certain brake difficulties.

"Inspection consists of checking the steering alignment to be sure that it is in accordance with the maker's specifications. The slightest indication of defective steering equipment is corrected immediately by our running repair department. When such a job is called for, the front wheels are removed and bearings inspected; wheels are checked for balance and brake drums for out-of-roundness; brakes are properly balanced."—*W. L. Briar, vice-president in charge eqpt., Kansas City Public Service Co.*

Balancing Pays • "We use a "stick gage' to check toe-in and set front wheels at from zero to 1/16 in. All front end work including the adjusting of caster, camber, toe-in, the checking of tie-rods and king-pins as well as changing of the front brake shoes and balancing of front wheels is handled by one man who is specially trained for this work and is skilled in the use of our equipment which is supplied by Bear Manufacturing Co.

"Every time the front brake shoes are changed, the drums are returned in a drum lathe to insure that they are concentric with the wheels. This operation is performed with the drums mounted on the wheels. The wheels also are balanced at this time.

"As a result of these practices we can point to a consistent increase in tire life. For example, in 1951 we changed 360 tires which had an average life of 91,900 miles per tire. In

Continued on page 128

Can You Help Provide Answers To These Questions ? ? ?

BRAKE MAINTENANCE—What mileage are you currently obtaining on brake lining—on brake drums—

What is your experience with "Normalized" brake drums—with Copperweld brake drums—

How can brake cam rollers and anchor pins be lubricated properly without getting lubricant on the brake lining?

What success have you had in reducing brake squeal by changing to a brake lining with a different coefficient of friction?

What have you been able to accomplish in way of equalizing the life between front and rear brake linings?

REMOVING OLD FLOOR COVERING—When preparing a bus floor for new floor covering, what is the best way of removing the worn floor covering other than to try to pry it up in small pieces?

Approximately what life do you obtain from present floor covering?

What make of floor covering is used?

How do you prevent covering from bulging or buckling at area near the entrances?

WHAT IS A ROAD FAILURE—The answer to this question are legion and it would be beneficial to all if a standardized definition could be developed. On our operation a road failure is so called when a coach fails to complete an assignment. On other properties, what yardstick determines: first, when is a road failure chargeable to maintenance; second, when chargeable to operation.

When a coach is replaced at end of a run for any reason but no actual delay has resulted, is this considered a road failure. Is any distinction made between a "road failure" and a "road delay?"

What is your company's definition of a "delay" or failure."

WHEN ASKING OR ANSWERING QUESTIONS—Please address your letter to the Editor, Consulting Department, BUS TRANSPORTATION, 330 West 42nd Street, New York 36, N. Y.

INDUSTRY IN REVIEW

NBTA's Campbell leads the way as . . .

Intercity Carriers Wage War on Rider Tax

● Transportation must still act as tax collector for the federal government although the passenger tax no longer serves its purpose . . .

● Now comes a plan to let the rider know just what he's paying for...educating him for his own good and the industry's good too.

• INTERCITY TRANSPORTATION's gloomy tax picture took on a brighter hue with the announcement that an all out war will be waged against the war-time Federal Passenger Transportation Tax.

What's more, the bus industry won't go it alone. Joining in the education of passengers will be the airlines and railroads. The outcome might be a sign of what can be accomplished if all three work together.

Heading the attack for the bus industry is P. J. Campbell, chairman of the National Bus Traffic Association, whose brainchild the new plan is.

What Is the Plan? • Passed as a war-time measure to curtail passenger travel, the 15 per cent tax has outlived its usefulness. Now, after several years of talk, transportation has come up with a leaflet attack designed to educate the rider.

Bus operators know that once a tax is on the books it's almost impossible to get it repealed. The only way to do it is with the public's support.

Campbell has called on all state associations to enlist the aid of their members and other carriers in purchasing specially prepared leaflets for national distribution to the riding public. NBTA has already made arrangements for group purchases of these leaflets.

The leaflet is designed to get the passenger where it counts—in the wallet. Under the heading, "You Paid a 15% 'War Tax' on this Ticket," the leaflet reads:

"This ticket cost you an extra 15 per cent . . . not part of the bus company's charge for the trip. The company merely serves as tax collector.

"The extra money you pay is a federal tax passed during World War II to discourage travel . . . there's no reason for it now . . .

"If you want the cost reduced, why not write to your Senator and Congressman and ask them to help get this tax repealed?"

Local Battle • Meanwhile at least one carrier has seen concrete results in another tax battle. Atlantic Greyhound came out on top in a Virginia Supreme Court decision which ruled that the city of Winchester had no authority to levy a business license tax.

The company admits only to operating a terminal in the city. Four other bus lines also use the terminal and pay Greyhound. But since it's run on a non-profit basis, it is exempt from such a tax, Greyhound argued. The Supreme Court concurred.

The opinion handed down said it was "hardly reasonable" to suppose . . . that joint operation of a terminal by several carriers be subject to tax while an individual operation remains exempt.

The court further ordered the city of Winchester to refund to Atlantic Greyhound license taxes which the company had paid for 1947, 1948 and 1950. It also ordered the return of any fees or penalties.

Governors' Study • Intercity men would do well to keep an eye on Gov. Herman Talmadge of Georgia. He and other members of the executive committee of the National Governors' Conference are studying the reciprocity program among states on bus and truck taxes. The reason: Ohio's recent imposition of a ton-mile tax. Beside Ohio, only New York and Oregon have such taxes. Said Talmadge, "If every state adopts these taxes it would break down our entire reciprocity program."

Money in its jeans . . .

Denver Plans Better Service . . .

• DENVER TRAMWAY CORP. will make sweeping changes in service, adding new routes and buses with "all possible speed," after getting the state Public Utilities Commission seal of approval on a two-cent fare increase.

The PUC, new to the job of ruling mass transportation in the mile-high city, granted the boost and at the same time ordered Tram to improve service to the tune of $1 million by July 1. Tram will comply, said W. A. Alexander, Tramway president.

It will:

• Buy at least 40 new 51-passenger diesel buses.

• Extend routes widely . . . initiate express routes.

• Add 440,000 miles this year at a cost of $300,000.

Year-long Battle • Tramway and the city of Denver had been fighting for a year over whether to put the cart or the horse first. Tram insisted that any improved service would hinge on a higher income . . . wanted the boost first. Denver demanded immediate improvements before an increase. Tram won.

But in granting the fare hike, the PUC admitted it had reached second base by way of left field. The question of a rate base was possibly the biggest single factor in the fight, and the PUC arrived at what it considered a fair return on investment "in reverse."

According to Joseph W. Hawley, PUC member and former chairman, the agency worked backwards in arriving at the $12 million fair value of Tram property. It first determined what improvements Tram should make and estimated their cost. Then using the rate of return, the PUC set the fair value rate base accordingly.

Using this method, the PUC can't break down the $12 million to the usual components of a rate base. So no one knows whether the controversial "going concern value" of $3,360,000, carried on Tramway's books, is included or not.

. . . Houston Maps Retrenchment

• DENVER TRAMWAY has weathered its stormy sessions with the city, but for Houston Transit down in Texas the conflict is reaching gale force.

Houston Transit, faced by an annual loss amounting to $80,000, wants to cut operating costs by eliminating unprofitable early morning and late night runs on 18 lines. But J. B. White, Houston's public service director, won't let it.

As a matter of fact, on hearing that service cuts were proposed by the transit firm, White suggested that it might be a good time to expand in an effort to get more riders.

Houston Transit, wise in the ways of transit, knows what the score is. Increased service now would only mean greater losses. It wants to cut service, and if failing in that would probably seek a fare increase or a zone system. HTC has already indicated that if relief isn't forthcoming the only solution would be an offer to sell to the city.

City fathers don't want to run HTC and would like to do something for it if only to stay out of the transportation business.

White in the meantime has held up any service cut until he can determine if they're needed.

Houston faces the problem of maintaining routes which carry an average of three passengers. And White admits some cuts could be made, but he doesn't say which ones.

Greyhound Garage Opens in Chicago

• GREYHOUND HAS STARTED operating buses from its new $1.5 million Chicago garage following a pattern set last March when it opened its swank Chicago terminal.

The new building, a one-story structure with 60,000 square feet of floor space, houses washing, servicing and repair facilities for all Greyhound buses operating in the Chicago area. A part of the space is devoted to the Greyhound reclamation plant, where engines, transmissions and differentials are completely rebuilt.

The new garage replaces three smaller ones, two which were leased and another to be razed for a housing project. It offers a centralized location and keeps buses off Loop streets when traveling to and from the new terminal.

Other Facilities • Beside shop space, the new garage includes a second floor portion of 10,000 feet devoted to maintenance offices, a public restaurant and an air-conditioned dormitory with over-night accomodations for 54 drivers.

The entire area not occupied by the garage itself is given over to parking space. All buses are stored there when not being serviced and are protected from freezing by a system of parking lot heaters.

The parking area is surfaced with concrete or crushed stone.

An Easy Switch • Since only 50 buses, used as stand-by equipment, were moved directly to the new plant, no problem was encountered in the shift. They were moved gradually during light traffic periods. Other vehicles were dispatched directly to the new property.

During the summer months, when bus travel is at its highest level, more than 300 buses will be serviced each day at the new garage. Approximately 200 workers will be employed in the garage and reclamation plant.

Seattle Will Go to Zone System In Effort to Avert 1954 Deficit

• ON THE HEELS of what seems to a successful move to a zone fare system by Indianapolis, the Seattle, Wash., Transit System has announced its intention of doing the same—probably about the first of March. The reason: To avert a deficit of $650,000 otherwise predicted for 1954 operations.

The new rate will affect particularly an area recently annexed to the city. The anticipated maximum fare would be 28½ cents for trips originating at the edge of the city limits, the same as the fare now being paid on a book of 30 commutation tickets by residents of the new area for service provided by a private company. Rates would scale down to the present 20 cents a trip or 16-2/3 cents with tokens.

Inducement • The system also plans to offer a "shoppers' special," similar to the one used by the San Francisco Municipal Railway, but providing a 10-cent fare for trips within the central district during the day.

The Transit Commission also plans to ask the city council for relief from the $200,000 annual occupation tax it now pays.

"Improving the method by which we transport people from their homes to work and the shopping areas is still the Number One problem facing our cities today," asserted Willard Maxwell, chairman of the Commission. "We can't build enough parking areas and super-highways to handle the volume of traffic by means of passenger cars. The transit coach, replacing 30 private automobiles, and with its ability of carrying large numbers of people, will prevent strangulation of business districts."

Bigger Buses • The Transit Commission intends to go even further in providing passenger space. It has decided to go ahead with plans to purchase 60 extra-wide buses for about $1.2 million, despite the fact its State Highway Commission permit allowing operation of the buses extends only until July 1, 1955.

The new vehicles will be 40 feet long and 102 inches wide and will carry 51 passengers.

Bids on the contract have been submitted by three companies, General Motors, Mack and Twin Coach.

As far as the operating permit goes, the Transit Commission isn't unduly worried. The present permit can be extended annually after its expiration, and the Commission has given assurances that it will be.

Downward Trend • Until the Transit Commission puts the zone fare system into effect, it will probably continue to lose money. Last year, up to the last two months passenger travel was down 12 per cent. The drop was less sharp at the end of the year —8.8 in November and 7.59 in December—bringing the total loss for the year to about 11.55 per cent. As usual, blame rests with the upswing in automobile riding.

Industry Briefs

Mergers • Federal-Mogul Corp. has taken over the assets of the Bearings Co. of America, consolidating two of the oldest bearings companies in America. Purchase terms: one share of Federal-Mogul $5 par value stock for every four shares of Bearings Co. stock outstanding.

Willard Storage Battery Co., wholly owned by Electric Storage Battery Co. (Exide), has merged with it after 51 years as a separate corporation. Willard and its own subsidiary, Willard of California, join three other Exide properties as divisions.

Resignation • A. F. McDouglad has resigned as general sales manager of the White Motor Co.'s Coach Division. He went to White in November, 1946 after nine years with Capital Transit in Washington, where he was equipment superintendent.

Growth • World-wide registration of all types of buses is up 150 per cent since 1940. Total registration then was 304,770. Latest figures place it at 758,511.

New Equipment • Volkswagen Microbus, popular in Germany for carrying small parties, will soon make its appearance on the British market. It carries seven passengers plus the driver; cost less than $2,800.

Conversion • Application has been made to the Maryland PSC by Potomac Edison Co. to replace its Frederick-Thurmont trolley line with buses. The application marks the end of a once vast railway system whose main problems now are ice, stray cows and honeysuckle on the tracks.

Atlanta's Telephone System Speeds Trolley Service

• ATLANTA TRANSIT CO. has installed a new telephone checking-dispatching system to end off-schedule transit service and trolley "bunching" on one of its busiest lines.

The new system, started last month, will be extended to other lines in the city if it proves worthwhile.

Robert L. Somerville, director of development for Atlana Transit, explains the system like this: Three telephone checking points have been established — two at turn-around points and the other at the end of the line. Conductors call in to a central office and depending on a master check sheet are told to continue as usual, skip stops or turn around. In this way trolleys running late can proceed without delay, since other trolleys are close behind.

In addition to the telephone service, the central supervisor can rely on a radio microphone. He can get in touch with supervisors in radio cars, who can go to the trouble spot.

According to Somerville, a telephone checking service is being used in San Antonio, Texas, where 86 per cent of the trolleys run on schedule. Atlanta's transit study shows that transit coaches are on time 60 to 70 per cent of the time.

Calendar of Events

A list of activities of interest to the bus industry

March

23-25 ATA Regional Meeting
Hotel Statler
Detroit, Mich.
23-24—Mechanical, Public Relations sessions
24—Small Operations
25—Management

April

8-9 Ohio Motor Bus Association
Neil House,
Columbus, Ohio

8-11 Midwest Automotive Trade Show
Kiel Auditorium
St. Louis, Mo.

27-30 ATA Regional Meeting
Hotel New Yorker
New York, N. Y.
27-28—Electrical Operations Sessions
28—Maintenance, Small Operations, Scheduling
29—Management Sessions
29-30—Plant Engineering

May

4-6 Fifth Highway Transportation Congress
Mayflower Hotel
Washington, D. C.
18-20 ATA Regional Meetings
Hotel Leamington
Minneapolis, Minn.
18-19—Accounting and Claims Div.
19—Maintenance — Small Operations
20—Management

24-26 Washington Hotel
Seattle, Wash.
24—General Session and Small Operations
25-26—Departmental Conferences:

June

17-19 Michigan Motor Bus Association
Park Place Hotel
Traverse City, Mich.

Fare Hikes Mean More '54 Sales, President of Flxible Forecasts

• HUGO H. YOUNG, president of the Flxible Co., sees better things ahead for the bus industry in 1954. In a year-end prediction, Young forecast increased sales in both transit and intercity vehicles despite transit's downward passenger trend which makes it tough sledding for some operators.

For 1954, Young foresees a 20 to 25 per cent increase in bus industry sales volume. This isn't his own estimate either. It's the result of industry estimates and market surveys.

Hugo H. Young

Fewer Replacements • According to Young, one of the biggest factors in favor of increased sales is the fact that so few buses have been purchased as replacement units in the past few years. This he attributes to the steady decline in riders since the war's end and to the failure of regulatory agencies to grant fare adjustment rapidly enough.

But Young also takes a more positive view. More than a few bus lines have shown substantial financial gains in the past year . . . for various reasons among which fare increases play a big role. These firms, he feels, will invest a large portion of their revenues in new and improved equipment.

Young also forecast a general expansion in the use of propane as a bus fuel during '54. He feels its odorless and smokeless properties make it an ideal transit fuel.

Highway Officials Place Road Needs At $54 Billion as States Show Jump

• THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS estimates the needed improvement on all Federal-aid highway systems at $34,951,312,000. This is an update of the figures compiled in 1951 and represents an increase of $3 billion over the 1951 figure, in spite of the more than $3 billion spent by the states and the Federal government on the systems since then.

Most states show an increase in need for improvement. New Jersey leads the parade with a jump of $650 million, even though the new turnpike has been finished since the last study. Florida showed the greatest proportionate increase, zooming from $230 million to over $330 million. Ohio's needs rose $400 million over the 1951 figure of $1,339,000,000, and Kentucky went from $556 million to $839 million.

In the other direction, 17 states registered a decrease in improvement needs. California showed the steepest decline dropping from $3,147,000,000 to $2,707,000,000. Pennsylvania and Oregon dropped about $100,000,000 each. Generally, the larger states registered the decreases, although most of them were minor.

Only four states, Minnesota, North Dakota, Tennessee and West Virginia, showed no change.

This increase in need contributed to the decision of AASHO to recommend that Congress increase the annual appropriation for the Federal-aid highway program to $900,000,000.

News Highlights Around the World

Rome Replacements

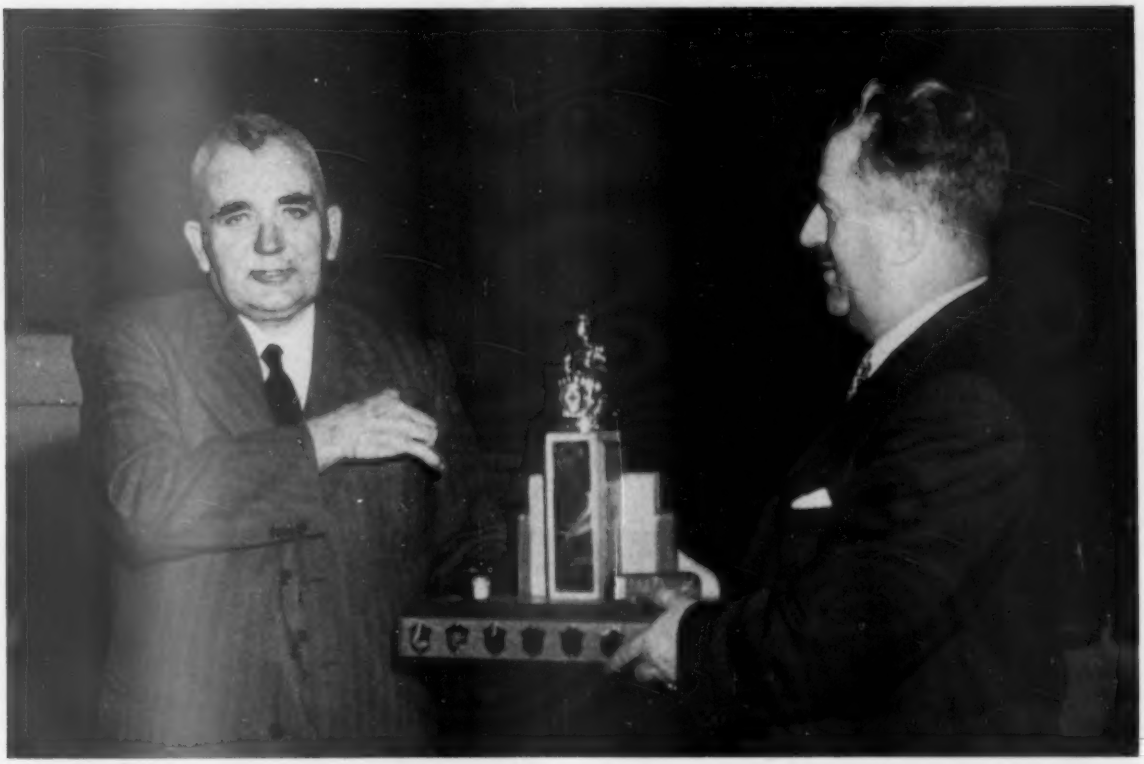
Ninety of these two-axle buses will replace the cumbersome trolley-buses in downtown Rome. It's hoped they'll combat traffic congestion.

Milan Music

Straphangers on Milan's streetcars now activate musical recordings when they hang onto their straps. The recording machines are installed underneath the seats of the car. It's a mixed blessing, if blessing it is, because the recordings include advertising spiels too.

Puerto Rico Bus Growth

A third bus has been added to Puerto Rico's first intercity bus line. This 29-passenger, air-conditioned Flxible joins two others in providing service along the north coast of the island from San Juan to Aguadilla and then from Aguadilla to Mayaguez. The Puerto Rico Motor Coach Company was started last June by Jesus F. Trilla. All Puerto Rican intercity travel before that was by means of private cars and taxicab.



Montreal Contest

Commissioner Leonard Leger, (right) presents "The President's Trophy" on behalf of Arthur Duperron, chairman and general manager of the Montreal Transportation Commission, to P. A. Ostiguy, superintendent of Mount Royal Division, winner of the 1953 Annual Accident Prevention Contest. The division reduced its traffic accident rate per 100,000 miles by 13 per cent. Cote St. Paul Division placed second in the contest.

Rio de Janeiro Traffic

"There's nothing like Rio for confusion," says traffic director Edgar Estrela. This picture shows what he means. One of these streets is heavily traveled, but can handle only three cars at a time.

Brazil's Modern Fleet

Sao Paulo, Pindamonhangaba, Cachoeira Paulista and points south. Those are the destinations of these 13 ACF-Brill buses, part of a 20-coach shipment to Empresa de Onibus Passaro Marron, South America.

DISCUSSING SUPERVISION problems are A. DeMayo, D. Fennell, R. Dalgleish, moderator, P. Askey and T. Owens.

CLEVELAND'S DON HYDE explains the benefits of express service and how it stimulates transit riding.

FORTY ATA MEN and guests fly in special plane to Lake Charles to tour Cities Service Oil Co. refinery.

THE ANDERSONS, George W., left, ATA executive veep, and Leland E., president of Atlanta Transit Company.

All-out War on Taxes Launched

• ONE OF THE MAJOR OBJECTIVES of the transit industry this year will be to obtain relief from unfair taxation, asserted Laurence Wingerter, ATA president in an opening address at Region IV regional and divisional conference in the Jung Hotel, New Orleans, JAN. 13 to 15. Total registration for the meeting was 290.

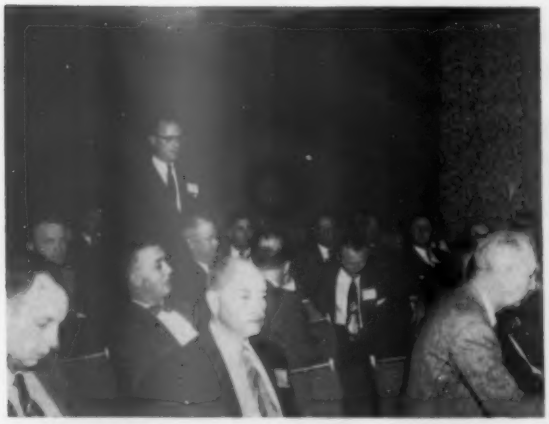
Addressing the management conference at the opening session Wingerter said "Transit companies in many sections of the country are still required to pay so-called monopoly taxes for use of the city streets, while no similar taxes are levied on the thousands of automobiles which compete with transit service."

This, he said, has contributed to the increase in bus and street car fares since World War II. Traffic congestion and increased operating costs also have contributed to higher fares. Equipment costs have risen 100 per cent in the past 12 years, Wingerter noted, while salaries have climbed 100 per cent.

Stating that 60 per cent of all urban workers and about 80 per cent of all shoppers in larger cities use public transportation, he gave notice that the transit industry will seek tax relief in every city where unfair imposts exist.

Wingerter, who also is president of San Antonio Transit Co., said that a special policy tax committee of ATA has been formed under the chairmanship of Harley L. Swift, Harrisburg, to fight for reduction of federal fuel tax which costs transit users about ten million dollars annually, as well as other local taxes bearing on the industry.

The ATA president urged indi-



NORMAN (PINKY) HILL, president of Capitol Transit, Little Rock, asks a question at session on operations.

AMERICAN TRANSIT CORP. was there in force. Delegation was led by president D. Giacoma, front center.

RECEPTION GUESTS are the Larry Wingerters, Orval Rahn, G. W. Anderson, Archie Stavely and P. Giacoma.

FROM ST. LOUIS PS came the Oscar Rexford's, (he's operating manager), and auto. eqpt. boss W. Williamson.

at ATA Meeting in New Orleans

vidual transit companies to analyze the special tax situation in their own communities, and to take up the crusade on a local level. Only a concerted effort of the industry toward a clearly outlined goal will produce results, he pointed out.

Management Conference • The meeting opened with a management conference, presided over by W. R. Burns, president and general manager of Dallas Railway & Terminal Co. Transit Pars continue to gain wider acceptance, if interest displayed by those who attended the meeting is any proof. Current status of Transit Pars activity was reviewed along with the experiences of individual properties in their use of this new management tool. The term "par" is now accepted as standard terminology by many bus operators.

How much an employee should know about his company's business was another topic which had widespread discussion at the management conference. This part of the conference discussed such factors as the amount of detailed information which should be given to supervisory personnel, and to all employees, concerning revenues, costs, profits, equipment purchases, conversions, modernization plans special promotion plans, applications for fare increases, traffic improvements, route changes and other matters pertaining to company affairs.

Some interesting differences of opinion arose as to when such information should be released, how best to release it and whether first line supervision should get as much

Continued on page 143

ABOUT PEOPLE . . .

YALE R. SCHIVELY, vice-president and general manager of Superior Coach Corporation has been appointed national public relations consultant for all divisions of the corporation.

DWAYNE A. SHIELDS has been appointed general manager of Superior Coach Corporation. He was active in the original planning, development and organization of the company's Kosciusko plant.

ALDEN H. WILLIAMS, formerly superintendent of equipment for the Connecticut Company has been appointed assistant general manager for the company. He has been affiliated with the firm since 1935.

GEORGE C. LEES, president of the U. S. Axle Company, Inc. has recently been awarded a certificate in recognition of a thirty-five year membership in the Society of Automotive Engineers.

ROBERT J. HEMKES has been promoted to field sales manager of the American Seating Company. Prior to his recent appointment he was eastern division sales manager for the seating company.

HENRY F. SCHAEFER has been promoted to western division sales manager for the American Seating Company. With the firm since 1934, he formerly was manager of the San Francisco branch.

R. H. PINKLEY, former president of the Milwaukee & Suburban Transport Corporation has been named chairman of the board of directors. He has been affiliated with the company since 1907.

J. H. LUCAS has been elected to the office of president of the Milwaukee & Suburban Transport Corporation. Formerly vice president and general manager, he has been with the corporation since 1917.

A. C. HOLMQUIST, secretary and treasurer of the Milwaukee & Suburban Transport Corporation has been elected vice-president. He will still continue as treasurer of the transport corporation.

E. L. LOCHEN has been elected assistant vice president of the Milwaukee & Suburban Transport Corporation. He will supervise transportation operation and maintenance activities for the company.

M. J. ZUROWSKI has been elected secretary and assistant treasurer of the corporation. With the firm since 1939, he formerly was assistant secretary and assistant treasurer of the corporaion.

J. B. DAVLIN has been appointed to the newly-created position of comptroller for the Milwaukee & Suburban Transport Corp. Prior to his recent appointment he was assistant secretary and assistant treasurer.

WILLIAM J. BEATTY, vice president in charge of sales for the ACF-Brill Motors Company has resigned recently. With ACF-Brill since 1909, he traveled extensively in Europe for the company.

BOB BLACK has joined the staff of the Van Norman Company as manager of the Jacksonville district of the automotive division. He has thirteen years of experience in the automotive field.

FRANCIS H. DAVIS has been elected vice-president in charge of sales for the Ross Gear and Tool Company. He succeeds S. L. Bradley who retired after 36 years of service with the company.

FRANK R. SOMERS has been appointed as vice president and assistant to the president of Willard Storage Battery Company. He has been associated with the company for 30 years in various positions.

FORREST BOYD has been made advertising and promotion director of National Transitads, Inc. Prior to his recent appointment he was with the E. H. Brown Advertising Agency in Chicago.

HARRY REESE has been appointed a sales representative of the midwest region for National Transitads, Inc. Formerly with the American Sky Advertising Company, he will now make his office in Chicago.

Ernest C. Brelsford has been elected treasurer of Thompson Products, Inc. (Ohio). He has been associated with the firm since 1945.

Charles Smith, Jr. has been elected president of the Valley Motor Transit Company (Ohio). He succeeds his father, the late **C. A. Smith.**

George H. Clifford, president since 1929 of Stone & Webster Service Corporation, New York and Boston has been named chairman of the board.

R. N. Benjamin, vice-president of Stone & Webster since 1948, was elected president of the business advisory service company.

Lee J. Sloan has been elected new president of the Missouri Bus and Truck Association. **Kenneth Churchhill** and **Roy Reed** were elected vice-presidents.

William Van Der Sluys has been appointed manager of the design division of Pullman-Standard Car Manufacturing Company's engineering department. He succeeds **A. M. Miers,** recently named manager of Pullman-Standard's Sales & Service Engineering Department.

Joseph L. Arnold, president of the Washington, Virginia and Maryland Coach Company, died recently.

Mr. Arnold has been with the transit company, which was founded by his father, for twenty-five years, and its president since 1947.

Clarence E. Killebrew has been elected vice-president of Clark Equipment Company. He formerly was manager for marketing and sales in Clark's construction machinery division.

William P. Maynard, formerly superintendent of the Virginia avenue plant, has been named assistant to the vice-president and general mgr.

Herbert R. Askins, president of Phoenix Auto Supply Company has been elected president of National Standard Parts Association for 1954.

Henry L. Miller has been named sales engineer for the Virginia Transit Company.

Stewart Hayes will now represent the Bergen Auto Upholstery Company of New Jersey in the New England Territory. **Robert Campbell** will take charge of the Southwestern area.

Matthew J. Betley has been appointed vice president and general manager of the Aeroquip Corp.

Howard Berndt, terminal manager for Continental Trailways bus center in Denver, Colorado, has been elected president of the Denver Passenger Traffic Association.

Summer S. Howard, manager of National Account Sales for AC Spark Plug Division of General Motors, died recently. He had been associated with the firm since 1919.

Donald L. MacDonald has been appointed manager of the transit operations for the Greater Winnipeg Transit Commission. He succeeds **C. H. Dahl,** who died recently.

B. Kirkendall has been appointed district sales manager of the Firestone Tire and Rubber Company.

BUS AND TROLLEY BUS DELIVERIES

Motor Bus Deliveries	Number of Buses	Manufacturers	Model and Type	Seat
Allen Transportation Co. (Calif.)	1	GMC	TDM-4512	45
Atlantic Greyhound Corp. (W.Va.)	5	GMC	PD-4104	41
Auch-Inter-Borough Transit Co. (Pa.)	5	GMC	TGH-3102	31
Baton Rouge Bus Co. (La.)	1	Southern	S-41HF	41
Battle Creek Coach Co. (Mich.)	3	GMC	TGH-3102	31
Buffalo Transit Co. Inc. (N.Y.)	2	GMC	TDH-4512	45
Leonardo Burrelli (Pa.)	1	GMC	TDH-4512	45
Capital Transit Co. (D.C.)	57	GMC	TGH-3102	31
Capitol Greyhound Lines Inc. (Ohio)	6	GMC	PD-4104	41
Carpenter Bus Lines Inc. (N.Y.)	1	GMC	TGH-3102	31
Casper Bus Co. (Wyo.)	2	GMC	TGH-3102	31
Central Greyhound Lines Inc. of New York (Ohio)	10	GMC	PD-4104	41
Chicago Transit Authority (Ill.)	27	Flxible	FL2P-40	52
Citizens Transit Lines (Calif.)	1	GMC	TGH-3102	31
Cross Transit Corp. (Ind.)	1	Marmon-Herrington	8MBA	27
Dallas Railway & Terminal Co. (Texas)	15	Southern	S-45-DHC	44
The Dayton & Xenia Motor Bus Co. (Ohio)	2	GMC	TDM-4515	45
Dixie Greyhound Lines (Tenn.)	6	GMC	PD-4104	41
City of Euclid (Ohio)	6	GMC	TDH-4512	45
Florida Greyhound Lines (Fla.)	16	GMC	PD-4104	41
Garfield Passaic Bus Lines (N.J.)	1	Marmon-Herrington	8M2BC	35
Great Lakes Greyhound Lines (Mich.)	10	GMC	PD-4104	41
Harrisburg Railways Co. (Pa.)	15	GMC	TDH-4512	45
Inter City Cus Co. (Wash.)	1	GMC	TGH-3102	31
Iowa City Coach Co. (Iowa)	3	GMC	TGH-3102	31
Louisville Transit Co. (Ky.)	18	GMC	TGH-3102	31
Manhattan Coach Lines Inc. (N.J.)	1	GMC	PD-4104	41
Miami Transit Co. (Fla.)	30	GMC	TGH-3102	31
Nashville Transit Co. (Tenn.)	8	GMC	TDH-4512	45
Northland Greyhound Lines Inc. (Minn.)	5	GMC	PD-4104	41
Northwest Greyhound Lines (Wash.)	5	GMC	PD-4104	41
Ohio River Mtr. Coach Co. (Pa.)	2	GMC	TDH-4515	45
Overland Greyhound Lines (Nebr.)	5	GMC	PD-4104	41
Penn Transit Co. (Pa.)	5	GMC	TDH-4512	45
Queen City Coach Co. (N.C.)	1	GMC	PD-4104	41
Reading Transportation Co. (Pa.)	1	Flxible	218GM7-54-37SU	37
Ridge Lines Inc. (Pa.)	1	Marmon-Herrington	8MBA	31
Safeway Suburban Lines (N.C.)	1	GMC	TGH-3102	31
Salina Transit Co. (Kansas)	1	GMC	TGH-3102	31
Southeastern Greyhound Lines (Ky.)	30	GMC	PD-4104	41
Suburban Transportation System (Wash.)	2	GMC	TGH-3102	31
Teche Greyhound Lines (La.)	19	GMC	PD-4104	41
Transcontinental Bus System Inc. (Texas)	6	GMC	PD-4104	41
Troy-Fifth Avenue Bus Co. (N.Y.)	2	Marmon-Herrington	8M2BA	32
Trumbull Coach Lines Inc. (Conn.)	1	GMC	TGH-3102	31
Twin City Lines Inc. (Ark.)	3	GMC	TGH-3102	31
Vicksburg City Lines (Miss.)	1	Fitzjohn	Cityliner	29
Wohlgemuth Bus Co. Inc. (N.J.)	1	GMC	TDH-4512	45
Zanetti Bus Lines (Wyo.)	2	Flxible	218B1-54-37SU	37
Miscellaneous Deliveries				
Holland Furnace Co. (Mich.)	1	Flxible	218F1-54	Special
Foreign Deliveries				
General Motor Corp. Foreign Distributors Div. (N.Y.)	2	GMC	TDH-4512	45
General Motors Overseas Operation (N.Y.)	1	GMC	TGH-3102	31
General Motors Products of Canada Ltd. (Canada)	4	GMC	TGH-3102	31
Instituto Poletecnico Nacional (Mex.)	1	Flxible	218B1-52-29IC	29
Puerto Rico Motor Coach (P.R.)	1	Flxible	218GM1-53	33
Puerto Rico Transp. Authority (P.R.)	10	Flxible	FT-35-53-44	44
Total Deliveries reported in this issue				369

Note: This list is based on monthly reports from manufacturers. Not all manufacturers report regularly, consequently, this list is not tobe considered complete.

1954 TROLLEY BUS SPECIFICATIONS

Line	TRADE NAME	Model	Unladen Weight, lb.	Wheelbase, In.	Over-all Length Over Bumpers, In.	WHEEL GAGE Front	WHEEL GAGE Rear	Inside Body Length, In.*	Overhang**	Turning Radius, Ft. †	TIRE SIZE Front	TIRE SIZE Rear	ELECTRICAL EQUIPMENT — Propulsion Equipment Make	Type	H.P.	Self or Forced Ventilation	Make	Type	Current Collection Equipment Make	Type	Trolley Retriever	Battery	Lighting Arrester
1	ACF-Brill.	TC-46	18,000	247	447 3/8	85	76	435	98 1/2	40	11.00-22	11.00-22	GE-W	1213-J or W 1442	140	S or F	GE-W	A	OB	11-T	Earll	Ex	Opt
2	ACF-Brill.	TC-48	18,300	247	463 3/8	85	76	451	114 1/2	40	11.00-22	11.00-22	GE-W	1213-J or W 1442	140	S or F	GE-W	A	OB	11-T	Earll	Ex	Opt
3	Marmon-Herrington .	TC-44	17,250	235	443 5/8	87 1/4	77 5/8	423	113 5/8	38	11.00-22	11.00-22	GE-W	GE-1213 or W 1442	140	S	GE-W	A	OB	11-T	Earll	Opt	No
4	Marmon-Herrington .	TC-48	17,750	264	472 5/8	87 1/4	77 5/8	452	113 5/8	42	11.00-22	11.00-22	GE-W	GE-1213 or W 1442	140	S	GE-W	A	OB	11-T	Earll	Opt	No
5	Marmon-Herrington .	TC-50	20,000	270	478 5/8	87 1/4	77 5/8	458	113 5/8	44	11.00-22	11.00-22	GE-W	GE-1213 or W 1442	140	S	GE-W	A	OB	11-T	Earll	Opt	No
6	Pullman-Standard . .	TC-48	19,800	265	480	86 3/4	71 5/8	464	116	40	11.00-22	11.00-22	GE-W	GE-1213 or W 1442	140	S	GE-W	A	OB	11-T	Earll	Opt	Opt
7	St. Louis Car Co. . .	St.L-48	19,300	268	478	86 3/4	71 5/8	458	102	43	11.00-22	11.00-22	GE-W	GE-1213 or W 1442	140	S or F	GE-W	A	OB	11-T	Earll	Ex	GE-W

Line	TRADE NAME (Continued)	BODY DETAILS Model	Maximum Seating Capacity	Headroom Min. Over Aisle	Aisle Width at Seat Cushion	Body Frame Material	Body Panel Material	Headlining Material	Roof Material	Side Wall Insulation	Heating Equipment	Ventilating Equipment	Total Heater Output Btu Thousands	Interior Light Fixture	High or Low Voltage Illumination	12, 30 or 120 Volt Lamps	Wattage, Amperage or CP Bulb	Floor Covering	Window Sash	Seats	Seat Filler	Upholstery Material	Door Control	Entrance Location	Exit Location
1	ACF-Brill.	TC-46	46	78	27	A-S	Al	Al	Al	Ma	Con	FD	12KW-Min	ESM	High	30V	1.6A	RB	Ed	N	CSP	VP	NP	AF	AR
2	ACF-Brill.	TC-48	48	78	27	A-S	Al	Al	Al	Ma	Con	FD	12KW-Min	ESM	High	30V	1.6A	RB	Ed	N	CSP	VP	NP	AF	AR
3	Marmon-Herrington . .	TC-44	44	78	30	A-S	Al	Al	Al	Asb	FD	FD	12KW-Min	ESM or L	High	30V	1.6A	R	Troy	Io	PxH	Kor	NP or Con	AF	AR
4	Marmon-Herrington . .	TC-48	48	78	30	A-S	Al	Al	Al	Asb	FD	FD	12KW-Min	ESM or L	High	30V	1.6A	R	Troy	Io	PxH	Kor	NP or Con	AF	AR
5	Marmon-Herrington . .	TC-50	50	78	30	A-S	Al	Al	Al	Asb	FD	FD	12KW-Min	ESM or L	High	30V	1.6A	R	Troy	Io	PxH	Kor	NP or Con	AF	AR
6	Pullman-Standard . . .	TC-48	48	78 1/4	28 1/2	S	S&MP	MP	S	MP	FD	FD	12KW-Min	ESM or L	High	30V	1.6A	RB	As-Ed	Opt	CSP	Opt	NP or Con	AF	AR
7	St. Louis Car Co. . .	St.L-48	48	78	30	A-S	Al	Al	Al	Air	Con	FD	12KW-Min	ESM or L	High	30V	1A	Opt	Ad	HW	CSP	Opt	NP or Con	AF	AR

Line	Rear Axle Make	Rear Axle Model	Standard Reduction Ratio	Springs Make	Springs Front—Length and Width, Ins.	Springs Rear—Length and Width, Ins.	Pads Under or Over Axle	Front Axle Make	Front Axle Model	Steering Gear Make	Steering Gear Type	Steering Gear No. Turns Full Lock to Full Lock	Brakes Make	Brakes Type	Brakes Front Drum—Diameter and Width	Brakes Rear Drum—Diameter and Width	Brakes Lining Area, Sq. Ins.	Brakes Dynamic—Regenerative	TRADE NAME
1	Tim	7582-W	11.58	R	62x4	68x5	U-F	Tim	2661-W	Ross	TW-74	7.0	Tim	WA	16 1/2x5	16 1/2x7	830	Dy-R	ACF-Brill
2	Tim	7582-W	11.58	R	62x4	68x5	U-F	Tim	2661-W	Ross	TW-74	7.0	Tim	WA	16 1/2x5	16 1/2x7	830	Dy-R	ACF-Brill
3	Tim	7578-PX	11.58		60x4	68x5	U-F	Tim	2652-PX	Ross	TE-71	. . . . .	Tim	PA	16 1/2x5	16 1/2x7	920	Dy-R	Marmon-Herrington
4	Tim	7578-PX	11.58		60x4	68x5	U-F	Tim	2652-PX	Ross	TE-71	. . . . .	Tim	PA	16 1/2x5	16 1/2x7	920	Dy-R	Marmon-Herrington
5	Tim	7578-PX	11.58		60x4	68x5	U-F	Tim	2652-PX	Ross	TE-71	. . . . .	Tim	PA	16 1/2x5	16 1/2x7	920	Dy-R	Marmon-Herrington
6	Tim	7579-PX	11.58	Ma	58x5	64x5	U-F	Tim	2652-PX	Ross	TW-74	7.0	Tim	WA	16 1/2x5	16 1/2x7	920	Dy-Opt R	Pullman-Standard
7	Tim	7579-P	11.42	Ma	60x4	64x5	U-F	Tim	2652-P	Ross	TW-74	. . . . .	BW 2	PA	16 1/2x5	16 1/2x7	920	Dy	St. Louis Car Co.

KEY TO ABBREVIATIONS

BODY DETAILS

Electrical Equipment

Earll
Ex - Exide
GE - General Electric
OB - Ohio Brass
W - Westinghouse
A - Automatic
F - Forced Ventilation
S - Self Ventilation

Axles

Tim - Timken

Springs

Ma - Mather
R - Rowland
O - Over
U-F - Under at rear-over at front

Brakes

B-W - Bendix Westinghouse
Tim - Timken
Dy - Dynamic
R - Regenerative
Dy-R - Dynamic with 2 or GE
- Regenerative with GE only
WA - Two-shoe, air operated

Materials

Al - Aluminum
Asb - Asbestos-Asphaltum
CBS - Copper Bearing Steel
MP - Masonite Presdwood
Ma - Mastic
Mas - Masonite
R - Rubber
RB - Rub Bub
S - Steel
VP - Vinyl Plastic

Heating and Ventilating

Con - Consolidated Car Heating
FD - Forced Draft

Lighting

ESM - Electric Service Mfg.
L - Luminator

Window Sash

Ad - Adams & Westlake
Ed - Edwards

Seats

CSP - Coiled Springs Padded
HW - Heywood-Wakefield
Io - Ionia
Kor - Koroseal
N - National
PxH - Paratex back, curled hair seats

Door Control

Con - Consolidated Car
NP - National Pneumatic

Door Location

AF - Ahead front axle
AR - Ahead rear axle

* Back of rear seat to inner front panel
** Center rear axle to rear bumper
† Outer clearance diameter smallest turning circle to left.

1954 MOTOR BUS COMPONENT PARTS

Int	TRADE NAME	MODEL NO.	POWER PLANT								RADIATOR			ELECTRICAL EQUIPMENT								Battery		
			Engine		Make Fuel Feed	Make Air Cleaner	Make Oil Filter	Type of Oil Cooling	Carburetor		Make Radiator	Make of Shutter	Type Shutter Control	Make Ignition	Make Starting Lighting		Make Voltage Regulator	Generator Capacity – Watts	Spark Plug Make	Size of Spark Plug, mm	Plugs Per Cylinder	Make	Capacity Amp. Hr., each	Number of Batteries
			Make	Model No.					Make	Model No.														
1	ACF-Brill	SU-17	Int.	RD-450	AC	Don	D	Own	H	AA-1G	P	Ky	TA	D	D	L	L	840	Ch	14	1	E	160	1
2	ACF-Brill	IC-41A	HS	190-S	C	U	HW	Groco	Z	63AW-16	G	Ky	TA	D	D	D	D	1000	Ch	18	2	E	160	2
3	ACF-Brill	IC-41AD	CUM	NHHS-600	CUM	Don	CUM	CUM	...	.....	G	Ky	TA	..	D	D	D	1000	....	....	..	E	160	2
4	ACF-Brill	C-44(z)	HS	190-1	C	U	HW	Groco	Z	63AW-16	G	Ky	TA	D	D	L	L	1400	Ch	18	2	E	160	1
5	ACF-Brill	C-31	Int	RD-406	AC	Don	D	Own	H	AA-1G	P	Ky	TA	D	D	L	L	840	Ch	14	1	E	160	1
6	ACF-Brill	C-51(z)	HS	190-2	C	U	HW	Groco	Z	63AW-16	P	Ky	TA	D	D	D	D	1680	Ch	18	2	E	160	2
7	Beaver	60-PT	Int	RD-450	AP	AC	M	R	H	.....	M	K	K	D	D		D	750				S	160	1
8	Beaver	B-71-PT	Int	RD-361	AP	Don	M	Int	H	.....	M	M	K	D	D	...	D	750	AC	14	1	B	150	1
9	Beaver	B-35-PT	Int	RD-450	AP	Don	M	Int	H	.....	M	M	K	D	D	...	D	750	AC	14	1	B	150	1
10	Beck	Beck-29	CUM or	JBS-600 or	CUM	Don	CUM	CUM	...	.....	MC	Cadillac	T	..	D	...	L	1200	....	....	..	D	155	OP
11	Beck	Manitou 9000	Int	RD-450	AP	Don	M	....	H	AA-1G	MC	Cadillac	T	D	D	...	L	1200	Ch	14	1	D	155	1
12	Beck	Luxury Liner	CUM	NHB-600	CUM	Don	CUM	CUM	...	.....	MC	Cadillac	T	..	L	...	L	1200	....	....	..	D	155	2
13	Beck	Beck & Holl	CUM	NHRBS-600	CUM	Don	CUM	CUM	...	.....	MC	Cadillac	T	..	L	...	L	1200	....	....	..	B	155	2
14	Fitzjohn-Cityliner	FTG-JXLD	Her.	JXLD	SW	V	M	M	Z	63AW-14	Y	Ky	K	D	D	D	D	750	Ch	7/8	1	D	150	1
15	Fitzjohn-Cityliner	FTG-WXLD	Her.	WXLD	SW	V	M	M	Z	29W-14	Y	Ky	K	D	L	L	L	849	Ch	14	1	D	150	1
16	Fitzjohn-Cityliner	FTD-DWXLD	Her.	DWXLD	B	V	P	P	...	.....	Y	Ky	K	D	L	L	L	849	....	....	..	D	205	2
17	Fitzjohn-Suburban-Liner	FSG-JXLD	Her.	JXLD	SW	V	M	M	Z	63AW-14	Y	Ky	K	D	D	D	D	750	Ch	7/8	1	D	150	1
18	Fitzjohn-Suburban-Liner	FSG-WXLD	Her.	WXLD	SW	V	M	M	Z	29W-14	Y	Ky	K	D	L	L	L	840	Ch	1/4	1	D	150	1
19	Fitzjohn-Duraliner	510	Her.	JXLD	SW	AM	M	M	Z	63AW-14	M	Ky	K	D	D	D	D	750	Ch	7/8	1	D	150	1
20	Fitzjohn-Super-Duriner	615	YAU	140GKS	SW	AM	M	M	Z	63AW-14	Y	Ky	K	D	D	D	D	750	Ch	7/8	1	D	150	1
21	Flxible	218F1-54	FAGEOL	FTC-180	E	Don	W	Own	H	885FFG	H	Ky	Ky	D	D	D	D	786	A	14	1	D	155	1
22	Flxible	218D1,67-54	Buick	FB-120	AP	AM	AC	O	ST	AAV-26	H	Ky	Ky	D	D	D	D	786	AC	14	1	D	155	1
23	Flxible	218JBS-1-54	CUM-D	JBS-680	CUM	Don	AC	CUM	...	.....	H	Ky	K	..	D	...	D	1200	....	....	..	D	155	1
24	Flxible	218GM-1-54	GM-D	6-71	GM-D	Don	AC	HA	...	.....	H	Ky	K	..	D	...	D	786	....	....	..	D	155	1
25	Flxible	182B1-52	Buick	FB-120	AP	AM	AC	O	ST	AAV-26	H	Ky	Ky	D	D	D	D	786	AC	14	1	D	155	1
26	Flxible-Twin-Coach	FL-30	FAGEOL	FTC-180	C	AM	W	Own	H	885-FFG	P	Ky	K	D-M	D-L	L	L	1500	Ch-A	14	1	E	160	1
27	Flxible-Twin-Coach	FT-33	FAGEOL	FTC-180 or FTC-200	C	Don	W	O	H	885-FFG	P	Ky	K	D-M	D-L	L	L	1500	Ch-A	14	1	E	160	1
28	Flxible-Twin-Coach	FT-35	FAGEOL	FTC-200	C	Don	W	O	H	885-FFG	P	Ky	K	D-M	D-L	L	L	1500	Ch-A	14	1	E	160	1
29	Flxible-Twin-Coach	FT-40	FAGEOL	FTC-200 or FTC-210	C	Don	W	O	H	885-FFG	P	Ky	K	D-M	D-L	L	L	1500	Ch-A	14	1	E	160	1
30	G.M. Coach	PD-4104	GM-D	6-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	2400	....	....	..	D	205	2
31	G.M. Coach	TDH-3714	GM-D	6-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
32	G.M. Coach	TDH-4512	GM-D	G-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
33	G.M. Coach	TDM-4515	GM-D	G-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
34	G.M. Coach	TDH-5105	GM-D	G-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
35	G.M. Coach	TDH-5106	GM-D	G-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
36	G.M. Coach	TDM-5108	GM-D	G-71	GM-D	AC	GMO-AC	HA	...	.....	L	Ky	TA	..	D	D	D	1800	....	....	..	E	175	2
37	Mack Diesel	C-33-D	Mack	END-673	B	V	L	No	...	.....	M	Ky	TA	..	D	...	D	1800	....	....	..	E	200	2
38	Mack Diesel	C-37-D	Mack	END-673	B	V	L	No	...	.....	M	Ky	TA	..	D	...	D	1800	....	....	..	E	200	2
39	Mack Diesel	C-45-D	Mack	END-673	B	V	L	No	...	.....	M	Ky	TA	..	D-L	...	L	1500	....	....	..	E	200	2
40	Mack Diesel	C-49-D	Mack	END-673	B	V	L	No	...	.....	M	Ky	TA	..	D-L	...	L	1500	....	....	..	E	200	2
41	Mack Diesel	C-491	Mack	END-673	B	V	L	No	...	.....	M	Ky	TA	..	D	...	L	1500	....	....	..	E	200	2
42	Marmon-Herrington	RMB & RM2B	Ford	RMB	C	.....	Ford	No	H	T-847	L	.....	TA	F	F	F	F	700	Ch	14	1	A	150	1
43	Marmon-Herrington	RM2C	Ford	EAL	C	.....	Ford	No	H	.....	L	.....	TA	F	F	F	F	700	Ch	14	1	A	150	1
44	Reo	35CA	Con	6427	C	Don	F	....	C	WCD	...	K	TA	D	D	...	D	1200	Ch	14M	1	W	152	..
45	Reo	37CA	WAU	140-GKB	C	Don	D	....	C	WCD	...	K	TA	D	D	...	D	1200	Ch	14M	1	W	152	..
46	Southern	F-31 & F-35	WAU	666ZA-59A	AP	Don	D	....	Z	29BW-14	Gen	O	K	D	Optional		Optional		Ch	18	1	OP	OP	1
47	Southern	F-35-DHH	Her.	DWXLD	B	Don	P	P	...	.....	Gen	O	K	D	Optional		Optional		Ch	14	1	OP	OP	2
48	Southern	S-41-HF	FAGEOL	FTC-200	AP	Don	D	....	H	885-FFG	Gen	O	K	D	Optional		Optional		Ch	14	1	OP	OP	1
49	Transit Buses	326	Cont.	K-6330	E	U	M	No	Z	29-ADA10	J	None	..	D	D	D	D	700	Ch	14	1	E	150	1
50	Transit Buses	332	Cont.	K-6330	E	U	M	No	Z	29-ADA10	J	None	..	D	D	D	D	700	Ch	14	1	E	150	1
51	Transit Buses	340	Lorei	SB-M340	C	U	P	No	Z	290-13	L	None	..	D	D	L	L	1400	Ch	14	1	E	150	1
52	White	1136	White	298-TA	C	Don	D	No	Z	103	M	Ky	K	D	D	...	L	1700	Ch	18	1	E	160	1
53	White	1140	White	24-A	C	Don	D	No	Z	88ADA	M	Ky	K	D	D	L	L	1800	Ch	18	1	E	160	1
54	White	1144	White	24-A	C	Don	D	No	Z	88ADA	M	Ky	K	D	D	L	L	1800	Ch	18	1	E	160	1
55	White	1136-S	White	298-TA	C	Don	D	No	Z	103	M	Ky	K	D	D	L	L	1700	Ch	18	1	E	160	1
56	White	1140-S	White	24-A	C	Don	D	No	Z	88ADA	M	Ky	K	D	D	L	L	1800	Ch	18	1	E	160	1
57	White	1144-S	White	24-A	C	Don	D	No	Z	88ADA	M	Ky	K	D	D	...	L	1800	Ch	18	1	E	160	1
58	White	1150DW	W-CUM	60TA	CUM	Don	CUM	CUM	...	.....	M	Ky	Ky	..	D-L	D-L	D	1800	....	....	..	E	200	2
59	White	1150D	W-CUM	60TA	CUM	Don	CUM	CUM	...	.....	M	Ky	Ky	..	D-L	D-L	D	1800	....	....	..	E	200	2
60	White	1144D	W-CUM	59TA	CUM	Don	CUM	CUM	...	.....	M	Ky	Ky	..	D-L	D-L	D	1800	....	....	..	E	200	2

KEY TO ABBREVIATIONS

(Z) – Torque Converter

Engine Make
Con – Continental
Cum – Cummins
GM-D – General Motors Diesel
HS – Hall Scott
Her – Hercules
Int – International Harvester
Rac – Waukesha

Air Cleaner Make
AC – A.C. Spark Plug Co.
AM – Air Maze
Don – Donaldson
U – United
V – Vortox
W – Winslow

Oil Filter Make
D – Delano
F – Fram
H or HW – Hahl Winslow
L – Luberfiner
M – Michiana-Duoflow
W – Winslow
P – Purolator

Oil Cooler Make
H – Harrington
HA – Harrison
O – Own
R – Ross

Carburetor Make
C – Carter
H – Holley
St – Stromberg
Z – Zenith

Fuel Feed Make
AC – A.C. Spark Plug Co.
AP – Autopulse
B – Bosch
C – Carter
E – Eclipse
SW – Stewart-Warner

Radiator Make
Chi – Chicago Mfg. Co.
F – Fedders
Fl – Fiese
G – G & O Mfg. Co.
H – Harrison
J – Jamestown

L – Long
M – Modine
Y – Young
Mc – McCord
O – Own
P – Perflex

Make of Shutter
Ky – Kysor

Battery Make
B – Bowers
D – Delco
E – Exide
H – Hobbs
P – Prestolite
W – Willard

Electrical Equipment
A – Auto Lite
B – United Amer. Bosch
D – Delco Remy
F – Ford
L – Leece Neville
M – Mallory

TRANSMISSION						RUNNING GEAR												TRADE NAME	
Clutch		Gearset		Universals		Axles, Front		Axles, Rear		Steering Gear		Foot Brakes		Hand Brakes					
Make	Model No.	Make	Model No.	Make	Model No.	Make	Model NO.	Make	Model No.	Make	Model No.	Type-Actuation-Air-Vac-Hyd-Mech.	Make - Actuation	Location	Type	Springs - Make	Wheels - Make		Line
L	14"	C	271T2	S	1600	C	F-684	T	56434-W	R	TA-66	A	BW	T	B	R	B	ACF-Brill	1
L	17" SP	S	8141	S	1700	T	2661-W	T	R-113-W	R	TW-74	A	BW	T	I	R	B	ACF-Brill	2
L	17" SP	S	8141	S	1700	T	2661-W	T	R-112-W	R	TW-74	A	BW	T	I	R	B	ACF-Brill	3
..	.....	S	918	S	1700	T	2775-W	R	59070-W	R	TA-71	A	BW	T	I	R	B	ACF-Brill	4
L	14	C	271-T2	S	1500	C	F-684	T	56434-W	R	TA-66	A	BW	T	B	R	B	ACF-Brill	5
..	.....	S	918	S	1700	T	2661-W	T	R-110-W	R	TW-74	A	BW	T	I	R	B	ACF-Brill	6
L	14"	BL	5331	S	1600	T	FE900-OPA	T	Q-110	R	TA-70	A	BW	Dr	D	Ma	B	Beaver	7
..	14-TT	BL	5331	S	1500	T	35141-P	T	L-110	R	TA-70	A	BW	Dr	D	Ma	B	Beaver	8
R	14-TT	BL	5331	S	1500	T	FD900-OPA	T	L-110	R	TA-70	A	BW	Dr	D	Ma	B	Beaver	9
L	14"	F	5A-43	S	1500	T	FD900	T	L-110	R	TA-69195	A	BW	T	Dr	C	B	Beck	10
L	14"	F	5A-430	S	1500	T	FD900	T	L-110-P	R	TA-72	A	BW	T	Dr	C	B	Beck	11
LR	17"	F	SC-72	S	1600	T	FE-900	T	Q-110-PX	R	TA-72	A	BW	Ds	D	C	B	Beck	12
LR	17"	F	SC-72	S	1700	T	FE-900	T	Q-110	R	T-71	A	BW	Dr	D	C	A	Beck	13
BB	13-E	C	271-T-6	S	1600	T	FD-900-WX-5	T	56434-WX-3	R	TA-66	A	BW	T	Ext	T	B	Fitzjohn-Citylinor	14
L	13-6	C	271-T-10	S	1600	T	FD-900-WX-5	T	56343-WX-3	R	TA-66	A	BW	T	Ext	T	B	Fitzjohn-Citylinor	15
BB	14-TT	C	271-T-7	S	1600	T	FD-900-WX-5	T	56434-WX-3	R	TA-66	A	BW	T	Ext.	T	B	Fitzjohn-Citylinor	16
BB	13-E	C	271-T-6	S	1600	T	FD-900-WX5	T	56434-WX-3	R	TA-66	A	BW	T	Ext	T	B	Fitzjohn-Suburban-Liner	17
L	13-6	C	271-T-10	S	1600	T	FD-900-WX5	T	56434-WX-3	R	TA-66	A	BW	T	Ext	T	B	Fitzjohn-Citylinor-Liner	18
LR	13-ML	C	230-F-48	S	1400	T	39519-WX-1	T	54430-WX-1	R	TA-66	A	BW	T	Ext	T	B	Fitzjohn-Duraliner	19
LR	15ML	C	326-Fa-15A	S	1600	T	36000-OPA-X6	T	L110-OPA-X7	R	TA-71	A	BW	T	Ext	T	B	Fitzjohn-Super-Duraliner	20
S	14	S	3453	S	1500	T	FD-900-OPA	T	H110-OPA	R	TA-67-191	A	BW	Ds	Dr	Ma-SP	B	Flxible	21
S	13-SP	S	3453	S	1500	T	FD-900-OPA	T	H110-OPA	R	TA-67-191	A	BW	Ds	Dr	Ma-SP	B	Flxible	22
S	14	S	3453	S	1500	T	FD-900-OPA	T	H110-OPA	R	TA-67-191	A	BW	Ds	Dr	Ma-SP	B	Flxible	23
S	15-4	F	4853-A	S	1500	T	FD-900-OPA	T	H110-OPA	R	TA-67-191	A	BW	Ds	Dr	Ma-SP	B	Flxible	24
S	13-SP	S	3453	S	1500	T	FD-900-OPA	T	H110-OPA	R	TA-67-191	A	BW	Ds	Dr	Ma-SP	B	Flxible	25
S	916	...	.....	S	1600	T	2666-W	T	L-110-W	R	TA-71	A	BW	T	Dr	Ma	B	Flxible-Twin-Coach	26
S	916	(FLUID AUTOMATIC)		S	1600	T	2666-W	T	Q-110-W	R	TA-71	A	BW	T	Dr	Ma	B	Flxible-Twin-Coach	27
S	916	(TORQUE CONVERTER)		S	1600	T	2664-W	T	Q-110-W	R	TE-71	A	BW	T	Dr	Ma	B	Flxible-Twin-Coach	28
S	916	...	.....	S	1600	T	2664-W	T	R-110-W	R	TE-71	A	BW	T	Dr	Ma	B	Flxible-Twin-Coach	29
S	13-SP	S	7141	S	1700	T	16910-WX1	T	59080-WX-1	R	TE-71	A	BW	T	Ext	Own(Air)	B	G.M. Coach	30
O	.....	O	V(Hyd.)	S	1600	T	16800-WX-1	T	57630-WX-2	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	31
O	.....	O	V(Hyd.)	S	1700	T	16930-WX-1	T	58620-WX-1	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	32
L	17" SP	S	7141	S	1700	T	16920-WX-1	T	58600-WX-1	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	33
O	.....	O	V(Hyd.)	S	1700	T	16931-WX-5	T	5962-WX-1	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	34
O	.....	O	V(Hyd.)	S	1700	T	16930-WX-1	T	59620-WX-1	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	35
L	17" SP	S	7141	S	1700	T	16930-WX-1	T	59610-WX-1	S	566-D-16	A	BW	D	I	Own(Air)	M	G.M. Coach	36
S	CL-52	S	TRH-59	S	1600	O	FA-551	O	RAS-1061	G	480	A	BW	D	B	R or MM	B	Mack	37
S	CL-52	S	TRH-59	S	1600	O	FA-551	O	RAS-1061	G	480	A	BW	D	D	R or MM	B	Mack	38
S	CL-531	S	TRH-58	S	1700	O	FA-403	O	RAS-402	G	500	A	BW	D	Dr	R or MM	B	Mack	39
S	CL-531	S	TRH-58	S	1700	O	FA-403	O	RAS-402	G	500	A	BW	D	Dr	R or MM	B	Mack	40
S	CL-531	S	TRH-58	S	1700	O	FA-502	O	RAS-402	G	980	A	BW	D	Dr	R or MM	B	Mack	41
L	12	S	2135	S	1500	T	53000	T	53589	G	.....	A	BW	Y	Ext	D	B	Marmon-Herrington	42
L	12	S	2135	S	1500	T	53000	T	53589	G	.....	A	BW	T	Ext.	D	B	Marmon-Herrington	43
S	14-SP	C	916	S	1600	T	56000	T	56410	R	TA-66	A	BW	T	I	ST	M	Rea	44
S	14-SP	C	916	S	1600	T	56000	T	56410	R	TA-71	A	BW	T	I	ST	M	Rea	45
BL	14-SP	S	5331 or 916	S	1600	T	FE-900-OPA	T	(H) L-110-OPA	R	TA-71	A	BW	T	D or Dr	Ma-MM	B	Southern	46
BL	14-SP	S	5331 or 916	S	1600	T	FE-900-OPA	T	L-110-OPA	R	TA-71	A	BW	T	D or Dr	Ma-MM	B	Southern	47
..	.....	S	916	S	1600	T	FE-900-OPA	T	Q-110-OPA	R	TA-71	A	BW	T	Dr	Ma-MM	B	Southern	48
BB	13E	Warner	T-87-D	S	1600	C	F-562-1	C	R-1001	R	TA-61	A	BW	DS	D	Wh	B	Transit Buses	49
BB	13E	"	T-87-D	S	1600	C	F-562-1	C	R-1001	R	TA-61	A	BW	DS	D	Wh	B	Transit Buses	50
L	15-4	...	.....	S	1600	C	F-812	C	R-1502	R	TE-71	A	BW	DS	D	Wh	B	Transit Buses	51
..	.....	Own	80-B	S	1600	O	33-D	O	88-C	R	Tw-75102	A	BW	T	D	SP	B	White	52
..	.....	Own	80-B	S	1700	O	33-D	O	88-C	R	TW-75102	A	BW	T	D	SP	B	White	53
..	.....	Own	80-B	S	1700	O	33-D	O	88-C	R	TW-75102	A	BW	T	D	SP	B	White	54
L	14" DP	S	560 & 908	S	1600	O	33-D	O	88-C	R	TW-75102	A	BW	T	D	SP	B	White	55
L	14" DP	S	560 & 908	S	1700	O	33-D	O	88-C	R	TW-75102	A	BW	T	D	SP	B	White	56
L	14" DP	S	560 & 908	S	1700	O	33-D	O	88-C	R	TW-75102	A	BW	T	D	SP	B	White	57
S	.....	S	918	S	1700	T	67-D	T	126-C	BP	77981	A	BW	T	Dr	SP	B	White	58
S	.....	S	918	S	1700	T	67-D	T	126-C	BP	77981	A	BW	T	Dr	SP	B	White	59
S	.....	S	918	S	1700	O	33D	O	88-C	R	A	A	BW	T	Dr	SP	B	White	60

KEY TO ABBREVIATIONS

Type Shutter Control
K – Kysor
TA – Thermostat-Air
T – Thermostat

Spark Plug Make
A – Autolite
AC – A.C. Spark Plug Co.
Ch – Champion Spark Plug Co.

Clutch Make
BB – Borg & Beck
BL – Brown Lipe

O – Own
L – Long
S – Spicer
LR – Lipe Rollway

Gearset Make
BL – Brown Lipe
C – Clark
F – Fuller
S – Spicer

Steering Gear Make
BP – Bendix Products
G – Gemmer
N – Ross
S – Saginaw

Brake Application
A – Air
H – Hydraulic
V – Vacuum Booster

Brake Make
BW – Bendix-Westinghouse

Hand Brake Location
T – Transmission

D – Differential
DS – Drive Shaft

Emergency Brake Make
B – Bend
D – Disk
Dr – Drum
Ext – External Band
I – Internal Expanding

Wheel Make
A – Alcoa
B – Budd

C – Clark
D – Dayton
M – Motor Wheel

Axle Make
C – Clark
E – Eaton
O – Own
T – Timken

Universal Make
S – Spicer

Spring Make
C – Cincinnati
D – Detroit Steel Products
IH – Int'l Harvester
Ma – Mather
Me – Merrill
Mn – Marmont
R – Rowland
SP – Spring Perch
St – Standard Spring Co.
T – Tidhill

1954 MOTOR BUS GENERAL CHARACTERISTICS

Line	TRADE NAME	MODEL NO.	Unladen Weight Ready for the Road	MAIN DIMENSIONS (Inches)						Outer Clearance Diameter Smallest Turning Circle (To Left) Ft.	Front Tire Size	Rear Tire Size	Engine Location	Rear Engine Mounted Transversely or Longitudinally	Water Capacity Entire Cooling Systems, Gals.	FUEL TANK	Clutch Lining Area Sq. In.	Type Transmission	Quiet in what Gears	TRANSMISSION					
				Wheelbase	Overall Length over Bumpers	Gage, Front	Gage, Rear	Inside Body Length Back of Rear Seat to Inner Front Panel	Distance Center Line – Rear Axle to Rear of Bumper							Total Capacity in Gallons				Type Transmission Control	Reduction Ratio		Number Universals	Rear Axle	
																					Low	High		Angle of Pinion Shaft (Deg.)	Total Reduction Ratio in High Gear
1	ACF-Brill	5U-27	13400	198	259	61-3/4	74	175	86-1/2	74	9.00x20	9.00x20	IR	T	10-1/2	75	218	CM	2-3	M	4.86	1.04	2	0	5.5
2	ACF-Brill	IC-41A	21000	270	419-1/2	80-1/8	71-1/4	387	186	84	11.00x22	11.00x22	UF	....	23	150	284	CM	4	M4	4.36	1.00	2	0	4-1/9
3	ACF-Brill	IC-41AD	22000	270	419-1/2	80-1/8	71-1/4	387	186	84	11.00x22	11.00x22	UF	....	23	150	284	CM	4	M4	4.36	1.00	2	0	4-1/9
4	ACF-Brill	C-44	18500	249	420	80-1/4	71	391	92	85	11.00x22	11.00x22	UF	....	20	107	...	H	...	A	...	1.00	2	0	5-1/7
5	ACF-Brill	C-51	11000	196	344	61-3/4	74	312	73-1/2	72	9.00x20	9.00x20	IR	T	10-1/2	65	218	CM	2-3	M3	4.86	1.04	2	....	5.94
6	ACF-Brill	C-61	21000	256	482-7/8	85	76	453-3/8	125	80	11.00x22	11.00x22	UF	....	20	120	...	H	...	A	...	1.00	2	0	5-4/7
7	Beaver	B-40PT	14700	222-1/4	402	80-1/2	72	337	106-1/2	75	9.00x20	9.00x20	IR	....	16	95	...	SM	3	M	3.80	1.00	2	....	6-5/6
8	Beaver	B-31PT	12000	164	322	69-1/4	69-3/4	266	104	58	9.00x20	9.00x20	IR	....	16	65	...	SM	3	M3	3.80	1.00	2	....	5.28
9	Beaver	B-35PT	13500	195	353	80	71-1/4	298	104	62	9.00x20	9.00x20	IR	....	16	65	...	SM	3	M3	3.80	1.00	2	....	5.28
10	Beck	Mainliner 9000	.....	231	420	80-1/8	71-1/2	359	109	80	10.00x20	10.00x20	IR	L	15	92	...	CM	3-4-5	M	4.61	1.00	2	....	5.28
11	Beck	Beck-29	.....	213-1/2	402	80-1/8	71-1/2	295	111	80	10.00x20	10.00x20	IR	L	14	82	...	CM	3-4-5	M	4.61	1.00	2	....	5.28
12	Beck	Beck & Half	.....	249	420	80	72	385	74	.....	11.00x22	11.00x22	IR	L	18	150	...	HG	All	M	4.43	1.00	2	....	4.62
13	Beck	Lee-Liner	.....	220	420	80	71-1/2	352	118	86	11.00x20	11.00x20	IR	L	15	92	...	CM	3-4-5	M	6.37	.778	2	....	4.11
14	Fitzjohn Cityliner	FTG-JXLD	12450	156-1/4	323-1/4	61-3/16	74	277	88-3/4	57	8.25x20	8.25x20	IR	T	12	60	178	CM	2-3	M	4.86	1.04	2	3	6.16
15	Fitzjohn Cityliner	FTG-JXLD	13300	182-1/2	351	61-3/16	74	304-3/4	88-3/4	65	9.00x20	9.00x20	IR	T	12	60	178	CM	2-3	M	4.86	1.04	2	3	6.16
16	Fitzjohn Cityliner	FTG-JXLD	13625	182-1/2	351	61-3/16	74	304-3/4	88-3/4	65	9.00x20	9.00x20	IR	T	12-3/4	60	214	CM	2-3	M	4.86	1.04	2	3	6.16
17	Fitzjohn Cityliner	FTD-QWXLD	14300	182-1/2	351	81-3/16	74	304-3/4	88-3/4	65	9.00x20	9.00x20	IR	T	14	60	202	CM	2-3	M	4.86	1.04	2	3	6.16
18	Fitzjohn Suburban-Liner	FSG-WXLD	13375	156-1/4	323-1/4	61-3/16	74	277	88-3/4	57	8.25x20	8.25x20	IR	T	12-3/4	60	214	CM	2-3	M	4.86	1.04	2	3	6.16
19	Fitzjohn Duraliner	510	14025	185-3/4	321-3/8	77-3/4	66-1/4	286	76	66-1/2	9.00x20	9.00x20	IF	T	14-1/4	75	178	SG	3-4	M	5.00	1.00	3	3	4.85
20	Fitzjohn Superduraliner	635	18400	254-1/2	401-1/2	80	71-1/2	365	83-1/2		11.00x20	11.00x20	IF	T	14	120	256	SG	4-5	M	4.34	1.00	4	3	5.28
21	Flxible	218 F1-54	15610	218	410-3/4	80-13/16	69-3/4	300	117	72	9.00x20	9.00x20	IR	L	14-1/2	78	106	SM	All	M	4.62	1.00	2	4	4-5/8
22	Flxible	218D1-54	15280	218	410-3/4	80-13/16	69-3/4	300	117	72	9.00x20	9.00x20	IR	L	13	78	90	SM	All	M	4.62	1.00	2	7	6.17
23	Flxible	218D6-54	.....	218	410-3/4	80-13/16	69-3/4	300	117	72	9.00x20	9.00x20	IR	L	13	78	90	SM	All	M	4.62	1.00	2	7	6.17
24	Flxible	218B7-54	15100	218	410-3/4	80-13/16	69-3/4	336	117	72	9.00x20	9.00x20	IR	L	13	78	90	SM	All	M	4.62	1.00	2	7	6.17
25	Flxible	218J1D1-54	15455	218	410-3/4	80-13/16	69-3/4	300	117	72	9.00x20	9.00x20	IR	L	14-1/2	78	106	SM	All	M	4.62	1.00	2	4	5.28
26	Flxible	182B-1-54	14450	182	374-3/4	80-13/16	69-3/4	264	117	67	9.00x20	9.00x20	IR	L	11	78	90	SM	All	M	4.62	1.00	2	7	6.17
27	Flxible	218GM1-54	.....	218	410-3/4	80-13/16	69-3/4	300	117	72	9.00x20	9.00x20	IR	L	14-1/2	78	125	SM	All	M	5.04	.78	2	4	4.62
28	Flxible Twin Coach	FT-30	14400	190-3/4	368	80-3/8	71-1/2	344	86-3/4	68	10.00x20	10.00x20	UF	....	13	80	170	A	...	A	5.5	1.1	2	0	6-1/6
29	Flxible Twin Coach	FT-33	18000	222	400	80-3/8	72	382	94	76	10.00x20	10.00x20	UF	....	13	125	170	A	...	A	5.5	1.1	2	0	6-5/6
30	Flxible Twin Coach	FT-35	16700	232-1/2	420	80-3/8	72	399	100	78	10.00x20	10.00x20	UF	....	13	125	170	A	...	A	5.5	1.1	2	0	6-5/6
31	Flxible Twin Coach	FT-40	19000	274-3/4	480	80-3/8	72	459	117-3/4	88	11.00x20	11.00x20	UF	....	13	125	170	A	...	A	5.5	1.1	2	0	6-5/6
32	GM Coach	TDH-3714	16210	210-1/2	398-1/2	79-1/4	70-1/2	336	76-3/4	74	10.00x20	10.00x20	IR	T	10-1/2	80	62	H	...	A	Hydraulic		2	8.5	4.98
33	GM Coach	TDH-4512	17960	230-3/4	420	78-7/8	70-1/2	389	100-3/4	78	10.00x20	10.00x20	IR	T	12-1/2	80	62	H	...	A	Hydraulic		2	7	4.98
34	GM Coach	TDH-4515	19830	230-3/4	420	78-7/8	70-1/2	389	100-3/4	78	10.00x20	10.00x20	IR	T	12-1/2	80	143	CM	All	M4	4.36	1.00	2	7	3.875
35	GM Coach	TDH-5105	19950	281-3/4	477	83-1/4	70-1/2	441	110	82	11.00x20	11.00x20	IR	T	12-1/2	80	62	H	...	A	Hydraulic		2	7	5.37
36	GM Coach	TDH-5106	19980	281-3/4	477	80-7/8	70-1/2	441	110	81	11.00x20	11.00x20	IR	T	12-1/2	80	62	H	...	A	Hydraulic		2	7	5.37
37	GM Coach	TDH-5108	21390	281-3/4	477	80-7/8	70-1/2	441	110	81	11.00x20	11.00x20	IR	T	12-1/2	80	143	CM	All	M4	4.36	1.00	2	7	4.125
38	GM Coach	TGH-3102	18110	188-1/2	325-5/8	81-1/4	75-1/4	267	76-1/4	66	8.25x20	8.25x20	IR	T	6.8	60	Hydramatic		All	A	3.82	1.00	2	3-1/2	6.71
39	GM Coach	PD-4104	20420	261	430	78-7/8	70-1/2	390	89-1/4	88	11.00x20	11.00x20	IR	T	14	140	143	CM	All	M4	3.86	1.00	2	3	4.125
40	Mack	C-33D	1700	180	346-5/8	79-7/8	71-7/8	324-1/2	85-5/8	55	10.00x20	10.00x20	IR	T	16	75	170	H	All	A	IV	1.05	2	57	5.78
41	Mack	C-37D	17650	213-3/4	380-3/8	79-7/8	71-7/8	356-1/4	85-5/8	64	10.00x20	10.00x20	IR	T	16	75	178	H	All	A	IV	1.05	2	57	5.78
42	Mack	C-45D	18100	261-1/2	428	79-15/16	76-7/8	405	80	74	10.00x20	10.00x20	IR	T	16	75	229	H	All	A	IV	1.29	2	52	6.16
43	Mack	C-41-D	17700	237-1/2	396	79-15/16	76-7/8	381	80	69	10.00x20	10.00x20	IR	T	16	75	229	H	All	A	IV	1.29	2	52	6.16
44	Mack	C-49-D	19080	289-1/2	472-1/2	79-11/16	76-7/8	476	80-3/4	72	11.00x20	11.00x20	IR	T	16	75	229	H	All	A	IV	1.29	2	52	6.16
45	Marmon-Herrington	8MD	10840	146	312-3/4	80-1/2	73-7/8	256	85-3/4	30	8.25x20	8.25x20	IR	T	11-1/2	60	140	CM	2-3	M	3.80	1.07	2	5.3	7.14
46	Marmon-Herrington	8MZB	10300	182	348-3/4	80-1/2	73-7/8	291	85-3/4	35	8.25x20	8.25x20	IR	T	11-1/2	60	149	CM	2-3	M	3.80	1.07	2	5.3	7.14
47	Marmon-Herrington	8MZC	10550	182	348-3/4	80-1/2	73-7/8	291	85-3/4	35	8.25x20	8.25x20	IR	T	11-1/2	60	149	CM	2-3	M	3.80	1.07	2	5.3	7.14
48	Ree	40CA	14500	186	372	79-3/4	69-3/4	.....	109	32	10.00x20	10.00x20	UF	....	16	93	...	H	...	A	Hydraulic		2	....	6.16
49	Ree	40CA	14500	186	372	79-3/4	69-3/4	.....	109	32	10.00x20	10.00x20	UF	....	16	93	...	H	...	A	Hydraulic		2	....	6.16
50	Southern	F-31-M	13150	175	321-1/2	80-1/4	69-3/4	340	71-1/2	62	9.00x20	9.00x20	UF	....	15	72	...	CM	All	M3	3.80	1.00	2	....	5-2/7
51	Southern	F-35-OOH	15700	198	356-1/2	80-1/4	71-1/2	375	90-1/2	68	10.00x20	10.00x20	UF	....	16	92	...	AH	...	...	...	...	2	....	6-1/6
52	Southern	S-41-HF	15000	223-1/2	391-1/2	80-1/4	72	410	99	74	11.00x20	11.00x20	UF	....	16	111	...	AH	...	...	...	...	2	....	6-1/6
53	Transit Buses	32E	11100	153-1/2	336	81-5/8	72	275	93-1/2	54	8.25x20	8.25x20	IR	L	10	60	178	CM	2-3	M	3.714	1.8	2	3	6.33
54	Transit Buses	33E	11500	181-1/2	364	81-5/8	73	303	93-1/2	60	8.25x20	8.25x20	IR	L	10	65	178	CM	2-3	M	3.714	1.8	2	3	6.33
55	Transit Buses	35E	15120	237-1/2	420	80-1/2	71-1/4	359	101	76	10.00x20	10.00x20	IR	L	17	90	250	CM	2-3	M	3.5	1.8	2	3	5.857
56	White	1136	16055	191	31'11"	80-3/8	71-3/4	344	101-7/16	66	10.00x20	10.00x20	UF	....	21-3/4	95	...	H	All	A	Hydraulic		2	....	6.17
57	White	1146	17460	214	35	80-3/8	71-3/4	369	101-7/16	72	11.00x20	11.00x20	UF	....	22-3/4	130	...	H	All	A	Hydraulic		2	....	5.57
58	White	1144	18010	238	36	80-3/8	71-3/4	393	101-7/16	74	11.00x20	11.00x20	UF	....	23-3/4	130	...	H	All	A	Hydraulic		2	....	5.57
59	White	1136S	17900	191	31'1"	80-3/8	71-3/4	340	101-7/16	66	10.00x20	10.00x20	UF	....	21-3/4	95	428	HG	All	M	4.07	1.00	2	....	6.17
60	White	1140S	19410	214	35	80-3/8	71-3/4	363	101-7/16	72	11.00x20	11.00x20	UF	....	22-3/4	130	428	HG	All	M	4.07	1.00	2	....	5.57
61	White	1144S	18850	238	36	80-3/8	71-3/4	387	101-7/16	74	11.00x20	11.00x20	UF	....	23-3/4	130	428	HG	All	M	4.07	1.00	2	....	5.57
62	White	1150DW	21000	268	39'-5 1/2"	85-1/8	73-5/16	453-1/2	121	78	11.00x22	11.00x22	UF	....	17	110	...	H	All	A	IV	...	2	0	6.16
63	White	1150D	20600	268	39'-5 1/2"	81-7/8	71-11/16	453-1/2	121	78	11.00x22	11.00x22	UF	....	17	110	...	H	All	A	IV	1.00	2	0	6.16
64	White	1144D	19500	238	34'-10 1/2"	80-3/8	71-3/4	398	100	74	11.00x20	11.00x20	UF	....	17	100	...	H	All	A	IV	1.00	2	0	6.16

KEY TO ABBREVIATIONS

Engine Location
C – Under hood at front
IF – Inside body at front
IR – Inside body at rear
UF – Under floor of body
R – Front or Rear

Engine Mounting
H – Horizontal
T – Transverse

Type Transmission
CM – Constant Mesh
HG – Helical Gear
SG – Selective Sliding Gear
A – Automatic
H – Hydraulic
M – Manual
RF – Reduction Ratios
IV – Infinitely Variable

Steering Gear
C&L – Cam and Lever
G – Gemmer
RB – Rock Ball
TL – Ross Twin-Lever
W&S – Worm and Sector
W&R – Worm and Roller
H – Hydraulic

Seat Filler Material
H – Hair
CHF – Cotton & Hair Felt
P – Purotex
R – Rubber
S – Spring

Type Sash
A – Adams & Westlake
E – Edwards
Ex – Excell
NL – National Lock Washer
R – Raise Type
T – Transportation

Type Seats
AM – American
B – ACF-Brill
K – Karpen
N – National
NR – Nonrecliner
R – Recliner
T – Tubular
U – Universal
Y – Ypsilanti

Heating and Ventilation
C – Consolidated Car
E – Evans Products
ES – Electric Service
H – Hans
K – Kysor Heater
Lin – Linder
M – Mack
T – Tropic-Aire

SPRINGS			STEERING		BODY PANEL																			
Front Length and Width (Inches)	Rear Length and Width (Inches)	Spring Pads – Over or Under Axle	Type Steering Gear	How Many Turns Full Lock to Full Lock	Max.-Min. Seat Capacity (without Jump Seats)	Min. Head Room Over Aisle (Inches)	Aisle Width at Seat Cushions (Inches)	Body Frame Material	Body Panel Material	Headlining Material	Roof Material	Insulation Material Side Walls	Make Heating and Ventilating System	Total Heater Output – B.t.u. thousands	Make Interior Lightning Fixtures	Type Floor Covering Material	Make Window Sash	Type Seats	Type Seat Filler Material	Type Seat Upholstery Material	Type Door Control	Entrance Door Location	Exit Door Location	Line
60x3	64x3	O-U	C & L	.....	37	79	17	S	AL	SA	AL	Mastic	E	97.2	ES	AT	E	N	S	VP	A	AF	..	1
64x4	70x5	O & U	C & L	.....	37-41	78-1/2	14-1/4	S&AL	AL	SA	AL	Fg	F	157	Lu	Acoton	A	K	SR	M	A	BF	..	2
64x4	70x5	O & U	C & L	.....	37-41	78-1/2	14-1/4	S&AL	AL	SA	AL	Fg	F	157	Lu	Acoton	A	K	SR	M	A	BF	..	3
66x4	76x4	O & U	C & L	.....	44	78	21	S&AL	AL	SA	AL	.....	E	111	ES	AT	E	N	S	VP	A	AF	RC	4
60x3	64x3	O & U	C & L	.....	31-33	78-1/4	21	S	AL	SA	AL	.....	E	91.2	ES	AT	T	N	S	VP	A	AF	FR	5
62x4	68x5	O & U	C & L	.....	51	78	28	S&AL	AL	SA	AL	.....	E	112	ES	AT	T	N	S	VP	A	AF	RC	6
60x3	60x3	....	B & L	.....	40-43	76	21	AL	AL	AL	AL	.....	E	100	ESS	A	A&W	T	S	H.&L	A	AF	RC	7
60x3	60x3	....	B & L	.....	31-33	76	21	AL	AL	AL	AL	.....	E	.....	ESS	A	A&W	T	S	H.&L	A	AF	RC	8
60x3	60x3	....	B & L	.....	36-37	76	21	AL	AL	AL	AL	.....	E	.....	ESS	A	A&W	T	S	H.&L	A	AF	RC	9
52x3	64x4	O & U	CL	5-1/2	33-37	77	16	S	AL	MAR	AL	W	E-M	100	KD	AT	E	N	Opt	M	M	AF	LC	10
52x3	58x3	O & U	CL	5-1/2	29-37	76	16	S	AL	MAR	AL	W	T&E	90	AR	AT	E	N	R	M	M	AF	LC	11
54x4	64x4	O & U	CL	5-3/4	37	76	18	S	AL	MAR	AL	W&FG	T	100	Lu	A	E	N	R	M	M	AF	LC	12
54x4	64x4	O & U	CL	5-3/4	37	76-3/4	16	S	AL	MAR	AL	W&FG	EH	.....	KD	AT	E	N	Opt	M	M	AF	LC	13
54x3	60x3	O & U	TL	7	29-31	76-1/2	22	S	AL	N	AL	C	K	86	G	A&AT	A	N	SoR	Ko	AE	AF	RC	14
54x3	60x3	O & U	TL	7	33-35	76-1/2	22	S	AL	N	AL	C	K	86	G	A&AT	A	K	SoR	Ko	AE	AF	RC	15
54x3	60x3	O & U	TL	7	33-35	76-1/2	22	S	AL	N	AL	C	K	86	G	A&AT	A	K	SoR	Ko	AE	AF	RC	16
54x3	60x3	O & U	TL	7	33-35	76-1/2	22	S	AL	N	AL	C	K	86	G	A&AT	A	K	SoR	Ko	AE	AF	RC	17
54x3	60x3	O & U	TL	7	29	76-1/2	22	S	AL	N	AL	C	K	86	G	A	A	K	R	M	AE	AF	RC	18
50x3	63-1/2x3	O & U	TL	7	28-32	74-1/2	15	S	AL	N	AL	C	K	70	G	A	A	K	R	M	A	AF	..	19
54x4	72x4	O	TL	7	36-40	74-1/2	15	S	AL	N	AL	C	K	70	G	A	A	K	R	M	A	BF	..	20
52x3	56x3	O & U	C & L	.....	29	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT&A	E	Gen	R	M	M	AF	LC	21
52x3	56x3	O & U	C & L	.....	29	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT-A	E	Gen	R	M	M	AF	LC	22
52x3	56x3	O & U	C & L	.....	29	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT-A	E	Gen	R	M	M	AF	LC	23
52x3	56x3	O & U	C & L	.....	37	78-1/4	21	S	S&A	N	AL	FG	K	70	Gen	AT-A	E	Gen	R	M	M	AF	LC	24
52x3	56x3	O & U	C & L	.....	29	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT&A	E	Gen	R	M	M	AF	LC	25
52x3	56x3	O & U	C & L	.....	25	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT-A	E	Gen	R	M	M	AF	LC	26
52x3	56x3	O & U	C & L	.....	29	78-1/4	16	S	S&A	N	AL	FG	K	70	Gen	AT&A	E	Gen	R	M	M	AF	LC	27
56x4	60x4	O & U	C & L	.....	36	78	23	S	AL	M&SA	AL	FG	Hans	130	Lu	RB	Gen	Gen	CHF	Ko	A	AF	FR	28
56x4	60x4	O & U	C & L	.....	40	78	23	S	AL	M&SA	AL	FG	Hans	130	Lu	RB	Gen	Gen	CHF	Ko	A	AF	FR	29
60x4	64x4	O & U	C & L	.....	44	78	23	S	AL	M&SA	AL	FG	Hans	130	Lu	RB	Gen	Gen	CHF	Ko	A	AF	FR	30
60x4	64x4	O & U	C & L	.....	52	78	23	S	AL	M&SA	AL	FG	Hans	130	Lu	RB	Gen	Gen	CHF	Ko	A	AF	FR	31
Air Suspension			RB	5.06	37	76-3/16	20	AL	AL	M	AL-S	PBF	Gen	90	Lu	R	V	Opt	Opt	Opt	A	AF	FR	32
Air Suspension			RB	5.06	46	76-3/16	20	AL	AL	M	AL-S	PBF	Gen	90	Lu	R	V	Opt	Opt	Opt	A	AF	FR	33
Air Suspension			RB	5.06	45	76-3/16	15	AL	AL	M	AL-S	PBF	Gen	101	Lu	R	V	Opt	Opt	Opt	A	AF	..	34
Air Suspension			RB	7.41	51	76-3/16	26	AL	AL	M	AL-S	PBF	Gen	90	Lu	R	V	Opt	Opt	Opt	A	AF	FR	35
Air Suspension			RB	7.41	51	76-3/16	20	AL	AL	M	AL-S	PBF	Gen	90	Lu	R	V	Opt	Opt	Opt	A	AF	FR	36
Air Suspension			RB	7.41	51	76-3/16	15	AL	AL	M	AL-S	PBF	Gen	126	Lu	R	V	Opt	Opt	Opt	A	AF	..	37
52x3	58x3	O	RB	5.2	31	76-1/2	20	S	S-AL	M	S-AL	.....	Gen	61	Lu	R	V	Opt	Opt	Opt	A	AF	FR	38
Air Springs	....	C & L	7.04	41	75-1/2	14-1/4	S&AL	AL	M	AL	FG	Gen	135	Lu	R	E	Opt	Opt	Opt	M	AF	..	39
62x3-1/2	62x4	U	W&R	S	33	76	21	HTS	AL	AL&M	AL-S	.....	M	.....	ES	RB	E	Opt	S	Ko	EP	AF	FR	40
62x3-1/2	62x4	U	W&R	S	37	76	21	HTS	AL	AL&M	AL-S	.....	M	.....	ES	RB	E	Opt	S	Ko	EP	AF	FR	41
62x3-1/2	62x4	U	W&R	7-3/4	46	76	21	HTS	AL	AL&M	AL-S	.....	M	.....	ES	RB	E	Opt	S	Ko	EP	AF	FR	42
62x3-1/2	62x4	U	W&R	7-3/4	41	76	21	HTS	AL	AL&M	AL-S	.....	M	.....	ES	RB	E	Opt	S	Ko	EP	AF	FR	43
62x4	62x4	U	W&R	7-3/4	49-50	76	21	HTS	AL	AL&M	AL-S	.....	M	.....	ES	RB	E	Opt	S	Ko	EP	AF	FR	44
54x3	58x3	O & U	W&R	.....	27-29	78	22	S	AL	AL	AL	W	E	62	CM	AT	E	Y	S	Ko	A	AF	FR	45
54x3	58x3	O & U	W&R	.....	31-35	78	22	S	S-AL	AL	AL	W	E	62	CM	AT	E	Y	S	Ko	A	AF	FR	46
54x3	58x3	O & U	W&R	.....	31-35	78	22	S	S-AL	AL	AL	W	E	62	CM	AT	E	Y	S	Ko	A	AF	FR	47
62x4	64x4	....	C & L	.....	37	78	20	S	S-AL	M	AL	.....	K	135	G	A	Ex	Y	S	IL	A	AF	FR	48
62x4	64x4	....	C & L	.....	40	78	20	S	S-AL	M	AL	.....	K	135	G	A	Ex	Y	S	IL	A	AF	..	49
62x3-1/2	70x4	O & U	C & L	.....	32	78	22	S	AL	SA	AL	FG	Gen	.....	ES	RB	Gen	T	R	Opt	A	AF	FR	50
62x3-1/2	70x4	O & U	C & L	.....	36	78	22	S	AL	SA	AL	FG	Gen	.....	ES	RB	Gen	T	R	Opt	A	AF	FR	51
62x3-1/2	70x4	O & U	C & L	.....	41	78	22	S	AL	SA	AL	FG	Gen	.....	ES	RB	Gen	T	R	Opt	A	AF	FR	52
56x3	56x3	U	TL	.....	28	80-15/16	21	S	AL	M	AL	.....	Lin	100	Lu	RB	E	Y	CHF	Ko	A	AF	FR	53
56x3	56x3	U	TL	.....	32-34	80-13/16	21	S	AL	M	AL	.....	Lin	100	Lu	RB	E	Y	CHF	Ko	A	AF	FR	54
56x4	58x4	U	TL	.....	34-42	80-13/16	21	S	AL	M	AL	.....	Lin	100	Lu	RB	E	Y	CHF	Ko	A	AF	FR	55
66x4	72x4	O & U	C & L	.....	36	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	99	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	56
66x4	72x4	O & U	C & L	.....	41	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	132	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	A	FR	57
66x4	72x4	O & U	C & L	.....	45	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	132	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	58
66x4	72x4	O & U	C & L	.....	37	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	99	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	59
66x4	72x4	O & U	C & L	.....	41	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	132	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	60
66x4	72x4	O & U	C & L	.....	45	79-5/16	20	AL-S	AL	For.	AL	Deadnor	Own	132	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	61
68x4	72x4	O & U	H	5.2-	50	78-3/8	21-1/2	AL-S	AL	For.	AL	Deadnor	Own	.....	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	62
68x4	72x4	O & U	H	5	50	78-3/8	21-1/2	AL-S	AL	For.	AL	Deadnor	Own	.....	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	63
66x4	72x4	O & U	H	5.7	44	77-5/16	21	A-S	AL	For.	AL	Deadnor	Own	132	Lu&ES	RB	Opt	Opt	Opt	Opt	NP	AF	FR	64

KEY TO ABBREVIATIONS

Type Floor Covering
A – Armstrong Linoleum
AT – Armstrong Automat
R – Rubber
RB – Rub-Rub

Type Door Control
M – Manual A – Air
AE – Air Electric
EP – Electro-pneumatic
H – Hydraulic
Vac – Vacuum

Door Location
AF – Ahead front axle
BF – Behind Frt Axle
FR – Ahead rear axle
LC – Left rear center
RC – Right hand center

Body Panel Material
AL – Aluminum
S – Steel

Headling Material
For. – Formica
M – Masonite
SA – Sheet Aluminum

Lightning Fixtures
CM – Columbus Metal Prod.
G – Guide
ES – Electric Service
G – Guide Lamp Co.
Lu – Luminaire

Insulating Material
A – Aircell
Ar – Arrow
C – Cellufoam
F – Felt
Fg – Fiber Glass
K – Kensul
PBF – Paper Black Foil
PF – Paper Foil
R – Reflectacel
RC – Rees Coil

Seal – Sealpack
SF – Stanelell
T – Thermocraft
W – Weico

Seat Upholstery Material
IL – Imitation Leather
Ko – Karonsol
L – Leather
M – Mohair
Y – Troy
VP – Vinyl Plastic

Body Frame Material
Al – Aluminum
CS – Carbon Steel
HTS – High Tensile Steel
O – Oak
S – Steel
WST – Welded steel tubing

1954 MOTOR BUS ENGINE SPECIFICATIONS

Line	Trade Name	Model No.	Horsepower Data: Max. B.H.P. or Governed Speed	Governed R.P.M.	Max. Torque – Ft. Lb.	R.P.M. at Max. Torque	No. of Points Suspension	Cylinders: No. Cylinders	Bore (inches)	Stroke (inches)	Piston Displacement (Cu. In.)	Standard Compression Ratio	Any Other Compression Ratios Available	Upper Crankcase: Crankcase and Block Cast Separate or Integral	Material – C.I. or Aluminum Alloy	Valves: Lower Crankcase Material	L or Overhead	Inserted Seat Facing Material	How are Inserts Secured in Block	Lift (inches)	Tappet Clearance Cold: Intake	Tappet Clearance Cold: Exhaust	Material: Intake	Material: Exhaust
1	Continental	T4427	170	3000	310	1600	3	6	4-5/16	4-7/8	427	6.4	Yes	I	CI	PS	O	SA	S	Int. .4460, Exh. .406	.018	.022	SA	A
2	Continental	R-6320	161	2350	266	1000	3	6	4	4-3/8	330	6.4	Yes	Int.	CI	PS	O	SA	S	Int. .4664, Exh. .4406	.018	.022	SA	A
3	Continental	D-6501	178	2600	314	1700	3	6	4-1/2	5-1/4	501	6.12	Yes	I	CI	PS	O	SA	S	3/8	.018	.024	SA	A
4	Continental	R6572	208	2800	451	1300	3	6	4-3/4	5-3/8	571.7	5.9	Yes	I	CI	PS	O	SA	S	1/2	.018	.024	SA	A
5	Dodge	C-1-F36	105	3200	194	1600	3	6	3-1/4	4-5/8	230.2	7.25	No	Int.	CI	..	L	SA	P	.365	.....	.....	Sil	Sil
6	Dodge	C-1-H50	115	3200	210	1200	3	6	3-7/16	4-1/2	250.6	7.8	No	Int.	CI	..	L	SA	P	.379	.....	.....	Sil	Sil
7	Dodge	C-1-J5C	120	3200	225	1200	3	6	3-7/16	4.766	265.37	7.8	No	Int.	CI	..	L	SA	P	.379	.....	.....	Sil	Sil**
8	Dodge	C-1-R56	151	3400	268	1600	3	8	3-13/16	3-5/8	331.1	7.8	No	Int.	CI	..	O	Sil	P	Int. .422, .488-Exh.	.....	.....	Sil	Sil
9	Fageol	FTC-200	200	2400	442	1400	3	6	4-3/8	5	451	7.5	Yes	I	CI	AL	O	No	..	.375	.012	.015	Sil-X.B	A-Sil
10	Fageol	FTC-210	210	2400	460	1500	3	6	4-1/2	5	477	7.5	Yes	I	CI	AL	O	No	..	.375	.012	.015	Sil-X.B	A-Sil
11	Fageol	FTC-100	100	2000	390	1600	3	6	4-1/4	4-1/4	404	7.5	Yes	I	CI	AL	O	No	..	.375	.012	.015	Sil-X.B	A-Sil
12	Flxible Buick	FB320	164	3400	278	2200	4	8	3-7/16	4-5/16	320	6.9	No	I	CI	PS	I	No	..	.367	.015	.015	3140	XCR
13	Flxible	185-6BB	150	2500	360	1400	3	6	4.12	5	401	15.5	No	I	CIA	AL	I	Sil	P	.....	.015	.025	SA	SA
14	Flxible	GMA-71	147	2000	425	1300	3	4	4.25	5	284	16	No	I	CI	PS	I	CA	P	.384	Port	.009	.....	Eatonite
15	Ford	6BB	106	3000	212	1200	4	6	3.5	4.4	254	6.8	No	I	CI	PS	L	S	P	.335	.011	.015	C-Sil	A-Head
16	Ford	6AL	139	3200	248	1700	4	6	3.86	3.5	279	7.2	No	I	CI	PS	I	MC	P	Int. .335, Exh. .310	.007	.023	CN	CN
17	G.M. Coach	270	125	3400	232	1000, 2900	3	6	3-25/32	4	269.5	7.5	No	Int.	CI	PS	I	No	P	Int. .395, Exh. .380	Hot .012	Hot .020	Sil	CN
18	Hall-Scott	500	180	2500	425	1600	3	6	4-5/8	5	504	6.0	Yes	I-W	CI	AL	I	Sil	P	.450	.025	.025	3140	2112
19	Hall-Scott	130	157	2600	375	1700	3	6	4-1/2	5	477	6.0	Yes	I-W	CI	AL	I	Sil	P	.450	.025	.025	3140	2112
20	Hall-Scott	100-1	108	2200	540	1400	3	6	5	6	707	6.0	Yes	I-W	CI	AL	I	SN	P	.482	.022	.022	31408	2112
21	Hall-Scott	190-2-5	220	2200	625	1300	3	6	5-1/4	6	779	5.6	Yes	I-W	CI	AL	I	SN	P	.482	.022	.022	3140	2112
22	Hall-Scott (Propane)	136-1	185	2500	420	1800	3	6	4-1/2	5	477	9.0	Yes	I-W	CI	AL	I	Sil	P	.450	.025	.025	Sil	2112
23	Hall-Scott (Propane)	100-4	225	2200	630	1400	3	6	5	6	706.8	9.0	Yes	I-W	CI	AL	I	Sil	P	.500	.022	.022	3140	2112
24	Hall-Scott (Propane)	190-4	250	2200	720	1200	3	6	5-1/4	6	779	9.0	Yes	I-W	CI	AL	I	Sil	P	.500	.022	.022	3140	2112
25	Hercules	QXLD	92	3200	190	1400	3	6	3-7/16	4-1/4	236.7	6.5	Yes	I	CIA	PS	L	No	X	.311	.008	.010	2112N	2112N
26	Hercules	JXD	110	3000	280	1200	3	6	4	4-1/4	320	6.5	Yes	I	CIA	PS	L	No	X	.356	.008	.010	3140	2112N
27	Hercules	JXLD	131	3200	272	1400	3	6	4	4-1/2	339	6.98	Yes	I	CIA	PS	L	No	X	.356	.010	.010	2112W	2112N
28	Hercules	WXLC-3	139	2600	312	1300	3	6	4-1/4	4-3/4	404	6.68	Yes	I	CIA	PS	L	No	X	.388	.012	.016	2112	2112
29	Hercules	TDXD	161	2600	366	1300	3	6	4-3/8	5-1/4	474	6.5	Yes	I	CIA	PS	L	No	X	.388	.010	.016	2112	2112
30	Hercules	TDXC	170	2600	388	1300	3	6	4-1/2	5-1/4	501	6.6	Yes	I	CIA	PS	L	No	X	.388	.010	.016	2112	2112
31	Hercules	RXC	143	2400	372	1100	3	6	4-5/8	5-1/4	529	6.5	Yes	I	CIA	PS	L	No	X	.388	.010	.016	3140	2112N
32	Hercules	RXLDR	181	2600	442	1400	3	6	4-3/4	5-1/4	558	6.5	Yes	I	CIA	AL	I	No	X	.442	.010	.010	NE8645	2112N
33	Hercules	HXC	175	2000	505	900	3	6	5-1/4	6	779	5.75	Yes	S	AL	PS	L	No	X	.469	.010	.016	3140	2112
34	Hercules	HXD	202	2000	645	900	3	6	5-1/2	6	855	5.75	Yes	S	AL	PS	L	No	X	.469	.010	.016	3140	2112
35	International Harvester	SD-240	107	1400	391.9	1400	3	6	3-9/16	4.816	240	6.5	Yes	I	CI	PS	O	Du	P	.3979	Hot .020	Hot .020	CN	XCR
36	International Harvester	BD-269	100.5	3000	232	1600	3	6	3-9/16	4-1/2	269	6.3	Yes	I	CI	PS	O	Du	P	.337	Hot .010	Hot .020	CNM	Sil-XCR
37	International Harvester	RD-377	138	2350	282.5	1600	3	6	4-1/8	4-1/2	372	6.3	Yes	I	CI	PS	O	Du	P	.4495	Hot .010	Hot .020	CNM	Sil-XCR
38	International Harvester	RD-400	150	2750	319	1200	3	6	4-3/8	4-1/2	406	6.3	Yes	I	CI	PS	O	Du	P	.4495	Hot .010	Hot .020	CNM	Sil-XCR
39	International Harvester	RD-450	159	2600	358.5	1200	3	6	4-3/8	5	450	6.3	Yes	I	CI	PS	O	Du	P	.4495	Hot .010	Hot .020	CNM	Sil-XCR
40	Transit Buses	H-6330 Con	145	2600	266	1800	4	6	4	4-3/8	330	6.5	Yes	I	CI	PS	O	SN	S	Int. .4664, Exh. .4406	Hot .020	Hot .024	Sil	Sil Faced
41	Transit Buses	H-560 Le Roi	200	2600	450	1800	4	8	4-1/2	4-1/4	540	6.7	Yes	I	CI	PS	O	Sil	P	.430	Hot .013	Hot..013	Sil Faced	Sil Faced
42	Waukesha	6WZA	128	2600	289	1000	3	6	4-1/4	4-3/4	404	5.6	Yes	I	CI	PS	L	CIA	..	7/16	.009	.020	3140	A
43	Waukesha	135-GKB	147	2800	337	1200	3	6	4-1/4	5	426	6.25	Yes	I	CIA	CIA	I	Sil	S	Int. .455, Exh. .423	.011	.023	3140	A**
44	Waukesha	135-GZB	153	2800	354	1200	3	6	4-3/8	5	451	6.3	Yes	I	CIA	CIA	I	Sil	S	Int. .452, Exh. .405	.011	.023	3140	A**
45	Waukesha	140-DKB	178	2600	425	1000	3	6	4-1/2	5-1/2	525	6.4	Yes	I	CI	CI	I	Sil	..	.524	.014	.025	A Sil	A Sil
46	Waukesha	145GKB	260	2400	595	1800	3	6	5-1/4	6	779	6.2	Yes	I	CI	CI	I	SN	..	.588	.014	.030	3140	A Sil
47	Waukesha	195GKA	122	3000	243	1600	3	6	4-1/8	4	320	6.2:1	Yes	I	CI	PS	I	SN	S	Int. .406, Exh. .411	.010	.020	CN	Sil
48	Waukesha	140GZB	188	2600	448	1100	3	6	4-3/8	5-1/2	554	6.4	Yes	I	CIA	CIA	I	SN	..	.524	.014	.025	3140	A Sil
49	White	280TA	175	2700	400	1300	3	6	4-5/8	5	504	6.5	Yes	I	CIA	AL	L	Sil	S	.423	0	0	.....	.....
50	White	24A	210	2700	560	1300	3	12	4-1/8	4-1/4	681	6.1	Yes	OS	CI	AL	L	SN	S	.381	0	0	3140	Silpo-B
	DIESELS																							
51	Cummins	HRBB-600	175	2000	505	1100	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	Sil	..	1/2	.014	.022	SA	SA
52	Cummins	HRBS-600	225	1800	695	1000	3	6	5-1/8	6	743	13.5	No	I	CIA	AL	I	SN	..	1/2	.016	.028	SA	SA
53	Cummins	NHBS-600	275	2100	710	1600	3	6	5-1/8	6	743	13.5	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA
54	Cummins	NHRBS-600	300	2100	800	1600	3	6	5-1/8	6	743	12.0	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA
55	Cummins	HB-600	150	1900	495	80	3	6	4-1/8	6	672	17	No	I	CIA	PS	I	SN	..	1/2	.014	.022	SA	SA
56	Cummins	NHB-600	200	2100	535	1200	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA
57	Cummins	A-A-600	180	2200	270	1200	3	6	4	5	377	16-1/4	No	I	CIA	AL	I	..	..	.406	.015	.025	SA	SA
58	Cummins	HRB-600	165	1900	540	1000	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	SN	..	1/2	.014	.022	SA	SA
59	Cummins	HBS-600	200	1800	645	1300	3	6	4-7/8	6	672	14	No	I	CIA	AL	I	SN	..	1/2	.015	.028	SA	SA
60	Cummins	JBS-600	150	2500	300	1400	3	6	4-1/8	5	401	15.0	No	I	CIA	AL	I	SN	..	.....	.015	.025	SA	SA
61	Cummins	NH NB-600	200	2100	535	1200	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA
62	Fageol-Diesel	FD-600	160	2400	452	1200	3	6	4.8	5.5	597	15.75	No	I	CI	AL	O	SN	S	.5	.020	.020	A-Sil	A-Sil
63	Fageol-Diesel	FD-690	180	2200	480	1200	3	6	5	5-3/8	677	15.75	No	I	CI	AL	O	SN	S	.5	.020	.020	A-Sil	A-Sil
64	G.M. Diesel	6-71 (70)	133	2000	400	1200	3	4	4-1/4	5	284	16	No	I	CI	PS	I	CA	P	.384	Port	Hot .009	.....	Eatonite
65	G.M. Diesel	4-71 (80)	147	2000	425	1300	3	4	4-1/4	5	284	16	No	I	CI	PS	I	CA	P	.384	Port	Hot .009	.....	Eatonite
66	G.M. Diesel	6-71 (70)	200	2000	600	1200	3	6	4-1/4	5	426	16	No	I	CI	PS	I	CA	P	.384	Port	Hot .009	.....	Eatonite
67	G.M. Diesel	6-71 (80)	220	2000	637	1300	3	6	4-1/4	5	426	16	No	I	CI	PS	I	CA	P	.384	Port	Hot .009	.....	Eatonite
68	G.M. Diesel	6-71 (90)	170	2000	540	1200	3	6	4-1/4	5	426	16	No	I	CI	PS	I	CA	P	.384	Port	Hot .009	.....	Eatonite
69	Hercules	DJX-6D	93	3000	186	1800	3	6	3-5/8	4	248	15.5	No	I'	CI	AL	I	No	..	.350	.010	.010	CN	Sil
70	Hercules	DJX-272	102	3000	204	1800	3	6	3-11/16	4-1/4	272	15.5	No	I'	CI	AL	I	No	..	.350	.010	.010	CN	Sil
71	Hercules	DJXH	99	2600	234	1400	3	6	3-3/4	4-1/2	298	15.5	No	I	CI	AL	I	TS	S	1/8	.010	.010	CN	Sil
72	Hercules	DWXLD	142	2600	333	1600	3	6	4-1/4	5	426	15.5	No	I	CI	AL	I	TS	S	25/64	.016	.016	CN	Sil
73	Hercules	DWXLDF	142	2600	319	1400	3	6	4-1/4	5	426	15.5	No	I	CI	AL	I	TS	S	25/64	.016	.016	CN	Sil
74	Hercules	DRXB	134	2200	358	1200	3	6	4-3/8	5-1/4	474	15.0	No	I	CI	AL	I	No	..	25/64	.016	.016	CN	Sil
75	Hercules	DRX-500	139	2700	388	1500	3	6	4-1/2	5-1/4	501	15	No	I	CI	AL	I	No	..	.390	.016	.016	CN	Sil
76	Hercules	DRXC	147	2200	398	1200	3	6	4-5/8	5-1/4	529	15	No	I	CI	PS	I	No	..	25/64	.016	.016	CN	Sil
77	Hercules	DFXD	217	2100	645	1200	3	6	5-1/2	6	855	14.8:1	No	I	CI	PS	I	TS	S	1/2	.010	.016	CN	Sil
78	Hercules	DFXE	228	2100	680	1200	3	6	5-5/8	6	895	14.8:1	No	I	CI	PS	I	TS	S	1/2	.010	.016	CN	Sil
79	Hercules	DFXETS	238	2000	860	1800	3	6	5-5/8	6	895	14.8	No	I	CI	PS	I	TS	S	1/2	.010	.016*	CN	Sil
80	Hercules	DFXH	260	2100	750	1200	3	6	5-3/4	6	935	14.8	No	I	CI	PS	I	TS	S	1/2	.010	.016	CN	Sil
81	Hercules	DFXHT	290	2100	750	1200	3	6	5-3/4	6	935	14.8	No	I	CI	AL	I	TS	S	1/2	.010	.016	CN	Sil
82	Mack	END-673	170	2100	480	1200	3	6	4-7/8	6	672	16.59	No	I	CIA	PS	I	PN	P	.5625	.016	.024	CSil	Stel
83	Mack	END-672	222	2000	640	1400	3	6	4-7/8	6	672	13.18	No	I	CIA	PS	I	PN	P	.500	.012	.020	CSil	Stel
84	Waukesha	135-DKB	147	2800	328	1600	3	6	4-1/4	5	426	17.5	No	I	CIA	CIA	I	SN	S	Int. .456, Exh. .375	.011	.023	A**	A**
85	Waukesha	135-DKBS	185	2600	400	1800	3	6	4-1/4	5	426	17.5	No	I	CIA	CIA	I	SN	S	Int. .456, Exh. .375	.011	.023	A**	A**
86	Waukesha	148-DKB	200	2100	584	1000	3	6	4-3/4	6	779	17.5	No	I	CIA	CIA	I	SN	S	Int. .477, Exh. .507	.015	.023	CN**	CN**
87	Waukesha	148-DKBS	280	2100	705	1800	3	6	5-1/4	6	779	17.5	No	I	CIA	CIA	I	SN	S	Int. .477, Exh. .507	.015	.025	CN**	CN**
88	White-Cummins	50TA	175	2100	480	1360	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA
89	White-Cummins	60TA	280	2100	560	1360	3	6	5-1/8	6	743	15.5	No	I	CIA	AL	I	SN	..	1/2	.014	.027	SA	SA

KEY TO ABBREVIATIONS

X – Information not given by manufacturer.

Cylinders
DS – Dry Sleeve
I – Cast in block
S – Sleeves in block
W – Wet sleeve

Crankcase
I – Integral with block

S – Cast Separately

Valve Arrangement
for O – Valves in head
L – Valves in block

Valve Inserts
P – Press fit

S – Shrunk

Main and Connecting Rod Bearings
CB – Centrifugally cast babbitt
CL – Copper-lead
CN – Cadmium nickel
CuN – Copper Nickel
B – Steel backed Babbitt
P – Plain babbitt
RSB – Removable steel-backed babbitt
SB – Steel-backed babbitt
SCL – Steel-backed copper-lead

Tri-M – Tri-Metal

Points Fed By Pressure
A – Auxiliary Shaft
C – Camshaft
I – Idler Shaft Bearing
M – Main Bearings

R – Connecting Rods
T – Tappets
TG – Timing Gear
V – Valve Rocker Arms
W – Wrist Pins

PISTONS								CONNECTING RODS				CRANKSHAFT									LUBRICATION SYSTEM			
		Wrist Pins				No. Rings			Bearings					Main Bearings										
Piston Material	Length (Inches)	Diameter (Inches)	Length (Inches)	Bearing Location	How are Wrist Pins Retained	Compression	Oil	Length	Type Material	Diameter (Inches)	Length (Inches)	Overall Length Shaft (Inches)	Weight of Crankshaft and Counterweights	Number of Counterweights	No.	Type Material	Diam. Main Bearings	Total Length Main Bearings	Projected Area Main Bearings (Sq. In.)	At Which Point is Thrust Taken	Total Oil Capacity – Qts.	Points Fed By Pressure	Engine Weight Without Accessories	Line
AL	4-11/16	1-1/4	3-43	F	SR	3	2	8-3/8	SCL	2-1/2	1-11/16	39-3/32	X	X	7	SCL	2-7/8	13-1/2	38-3/16	1st	8	C-M-R-TG-V	990	1
AL	4-3/4	1-10	3.43	F	SR	3	2	8-3/8	SCL	2-3/8	1-3/8	35-7/16	.....	..	7	SCL	3-62	12-5/732	31-37/64	1st	7	C-M-R-TG-V	850	2
AL	5-15/16	1-1/2	3.72	F	SR	3	2	10-1/2	SCL	3-3/4	1-13/16	48-3/16	X	X	7	SCL	2-3/4	14-1/8	38-27/32	1st	12	C-M-R-TG-V	1790	3
AL	5-15/16	1-1/2	3.72	F	SR	3	2	10-1/2	SCL	3	1-15/16	46-21/32	X	X	7	SCL	3-1/4	14-1/2	47-1/2	1st	14	C-M-R-TG-V	1575	4
AL	3-11/16	55/64	2-3/4	-	SR	2	2	7-13/16	SB	2-1/16	1.00	28-3/4	75-1/2	9	4	SB	2-1/2	4.875	12.062	4th	5	C-M-TG	490	5
AL	3-3/4	55/64	2-7/8	-	SR	2	2	7-7/8	SB	2-1/8	1.000	31-1/32	90	9	4	SB	2-1/2	5.054	12.635	4th	5	C-M-TG	525	6
AL	3-3/4	55/64	2-7/8	-	SR	2	2	7-7/8	SB	2-1/8	1.000	31-1/32	90	9	4	Tri-M	2-1/2	5.054	12.635	4th	6	C-M-TG	525	7
AL	3.888	63/64	3.145	-	SR	2	1	6-5/8	Tri-M	3-1/4	29/32	28-15/32	.....	..	5	Tri-M	3-1/2	5.890	12.75	2nd	9	C-M-TG-T	735	8
AL	4-5/8	1-1/4	3-5/8	R	SR	3	1	8-3/8	Tri-M	2-1/2	1-1/2	39-3/8	134	12	7	Tri-M	2-5/8	10.140	26.617	Ctr	12	C-M-R-V	954	9
AL	4-9/16	1-1/4	3-7/8	R	SR	3	1	8-3/8	Tri-M	2-1/2	1-1/2	39-3/8	133	12	7	Tri-M	2-5/8	10.14	26.617	4th	12	C-M-R-V	954	10
AL	4-7/8	1-1/4	3-5/8	R	SR	3	1	8-3/8	Tri-M	2-1/2	1-1/2	39-3/8	133	12	7	Tri-M	2-5/8	10.14	26.617	4th	12	C-M-R-V	990	11
AL	4-9/16	.8749	3-1/16	P	-	2	2	9	SCL	2-1/4	1-5/16	41-1/16	.....	..	5	D	2-13/16	7.15	.....	3rd	10	C-M-R-T-V	867	12
AL	4.75	1.5	3.87	F	SR	3	2	9.5	SCL	2.62	2	41.25	.....	..	7	SCL	3.87	8.7	33.64	7th	17	C-M-R-V-W	1545	13
MI	6	1.5	3.36	F	SR	4	2	10.12	Tri-M	2.75	1.78	54.93	190	4	5	Tri-M	3.5	5.62	19.69	5th	21	A-CI-M-R-V-W	1340	14
AL	3.86	.850	3.118	F	SR	2	1	6-1/4	SCL	2.290	1.203	51.272	83	7	7	4.972	2.874	4.972	13.80	4th	10	C-M-R-TG	....	15
AL	.392	.927	3.8220	F	SR	2	2	7.06	SCL	2-1/4	.889	26.20	62	8	5	SCL	3-5/8	7.125	18.75	3	9	C-M-R-V-E	780	16
AL	.390	.927	3.55	F	SR	3	1	7	8400	2-5/16	1-1/8	33-3/4	85	9	4	8400	.....	5-15/32	14.97	3rd	8	C-M-R-TG-V-W	535	17
AL	5.5	1-1/8	3.98	F	LR	2	2	11	SCL	2-5/8	1-3/4	44-13/16	125	4	7	SCL	3	11.9	35.7	7th	18	C-M-R-V	1790	18
AL	5.04	1-1/8	3-63/64	F	LR	2	2	11	SCL	2-5/8	1-3/4	44-13/16	125	4	7	SCL	3	11.9	35.7	7th	18	C-M-R-V	1775	19
AL	6-17/32	1-3/8	4.2	F	LR	2	2	11	SCL	3-3/8	2-3/4	47-53/64	203	4	7	SCL	3-1/4	12-9/16	40.8	7th	28	C-M-R-V	1786	20
AL	6-5/32	1-3/8	4.44	F	LR	2	2	11	SCL	3-3/4	2-3/16	47-53/64	203	4	7	SCL	3-1/4	12-9/16	40.8	7th	28	C-M-R-V	1786	21
AL	6-3/32	1-1/8	3-63/64	F	LR	2	2	11	SCL	2-5/8	1-3/4	44-13/16	125	4	7	SCL	3	11.9	35.7	7th	18	C-M-R-V	1275	22
AL	6-27/32	1-3/8	4.20	F	LR	2	2	11	SCL	3-3/4	2-3/16	47-53/64	203	4	7	SCL	3-1/4	12.56	40.8	7th	28	C-M-R-V	1790	23
AL	6-45/64	1-3/8	4.44	F	LR	2	2	11	SCL	3-3/4	2-3/16	47-53/64	203	4	7	SCL	3-1/4	12.56	40.8	7th	28	C-M-R-TG-V-W	1790	24
AL	3-7/16	7/8	2-29/32	P	XLR	3	2	7	Tri-M	2	1-1/4	29-1/2	46	12	7	Tri-M	2-1/2	10-1/16	25.15	7th	6	B-R-T-G-I	685	25
AL	4-3/16	1-1/8	3-7/16	F	SR	2	2	8	Tri-M	2	1-1/2	33-7/16	77	12	7	Tri-M	2-1/2	10.81	27.02	7th	9	B-R-T-G-I-W	685	26
AL	4-1/16	1-1/8	3-7/16	F	SR	2	2	8	Tri-M	2	1-1/2	33-7/16	79	12	7	Tri-M	2-1/2	10.81	27.02	7th	9	B-R-T-G-I-W	630	27
AL	4-3/8	1-1/8	3-11/16	F	SR	2	2	8-3/8	Tri-M	2-1/4	1-1/2	37-3/8	107	12	7	Tri-M	2-5/8	13.25	34.78	7th	7	B-R-T-G-I	825	28
AL	4-7/8	1-5/16	3-5/8	F	SR	2	2	9-3/8	Tri-M	2-5/8	2	41-5/8	154	12	7	Tri-M	3	13.25	39.75	7th	10	B-R-T-G-I	1270	29
AL	4-13/16	1-5/16	3-5/8	F	SR	2	2	9-3/8	Tri-M	2-5/8	2	41-5/8	154	12	7	Tri-M	3	13.25	39.75	7th	10	B-R-T-G-I	1290	30
AL	4-7/8	1-1/4	4-1/6	P	XLR	4	2	9-3/8	Tri-M	2-5/8	2	41-5/8	154	12	7	Tri-M	3	13.25	39.75	7th	10	B-R-T-G-I	1810	31
AL	4-7/8	1-1/2	4.115	F	SR	2	2	9-3/8	Tri-M	3	2	41-5/8	162.5	12	7	Tri-M	3-1/2	13.25	46.37	7th	13	B-R-T-G-I	1320	32
AL	6-1/2	1-1/2	4-9/16	P	XLR	3	1	12	SCL	3	2-1/4	50-9/16	274	12	7	SCL	3-1/2	16.62	50.17	7th	14	B-R-T-G-I	1810	33
AL	6-1/2	1-1/2	4-13/16	P	XLR	3	1	12	SCL	3	2-1/4	50-9/16	270	12	7	SCL	3-1/2	16.62	50.17	7th	14	B-R-T-G-I	1830	34
AL	3-7/8	7/8	2-61/64	F	SR	3	1	6-13/16	SB	2.375	1-5/32	34-3/32	95	..	4	SB	2-3/4	6-3/16	17.01	4th	8	C-M-R-TG-V-W	607	35
AL	5-15/16	1-9/64	3-61/64	F	SR	3	1	8-9/16	SCL	2.125	1-13/32	34-25/32	106	..	4	SCL	2.7	6-47/64	12.78	4th	8-1/2	C-M-R-TG-V-W	781	36
AL	4-15/16	1-7/64	3-51/64	F	SR	3	1	9	SCL	3-1/4	1-3/8	39-1/16	142	..	7	SCL	3-1/4	14.71	10-11/16	7th	10-1/2	C-M-R-TG-V-W	1705	37
AL	4-3/4	1-7/64	3-51/64	F	SR	3	1	9	SCL	3-1/4	1-3/8	39-1/16	145	..	7	SCL	3-1/4	14.71	10-11/16	7th	10-1/2	C-M-R-TG-V-W	1706	38
AL	4-1/2	1-7/64	3-51/64	F	SR	3	1	9	SCL	3-1/4	1-3/8	39-1/16	151	..	7	SCL	3-1/4	14.71	10-11/16	7th	10-1/2	C-M-R-TG-V-W	1707	39
AL	4-1/4	1-7/64	3.18	F	SR	3	2	8-3/8	SCL	2-1/4	1-9/16	36-7/16	97-1/4	12	7	SCL	2-5/8	12-1/32	.....	Front	7	C-M-R-TG-V-W	850	40
AL	5-1/8	1.25	3.93	F	SR	2	1	8.5	SCL	2-3/4	1-1/4	34-1/8	102-1/2	6	5	SCL	3-1/4	5.98	19.935	Ctr	10	C-M-R-TG-V-W	1250	41
AL	4-1/2	1	4	F	SR	3	1	8-3/8	Tri-M	2-1/4	1-1/2	34-5/16	77	8	7	Tri-M	2-5/8	13-1/4	34.8	7th	8	A-C-M-R-W	979	42
AL	4-15/16	1-1/2	4-5/8	F	SR	3	1	9-1/2	SCL	3	1-5/8	39-1/2	X	6	7	SCL	3-1/4	15	48.75	7th	12	B-R-R-C-V	1325	43
AL	4-15/16	1-1/2	3-5/8	F	SR	3	1	9-1/2	SCL	3	1-5/8	39-1/2	X	6	7	SCL	3-1/4	15	48.75	7th	12	B-R-R-C-V	1325	44
AL	5-9/16	1-3/8	3-7/8	F	SR	3	1	10-1/4	SCL	2-5/8	20	45	186	12	7	SCL	3-1/4	15-1/2	50.4	7th	18	B-R-R-C-V	1790	45
AL	6-1/2	1-5/8	4-1/2	F	SR	3	1	11-3/4	SCL	3	2-1/4	50-1/4	248	12	7	SCL	3-1/2	17-3/4	62-1/4	7th	18	B-R-R-C-V	1810	46
AL-CIA	4-7/16	1-1/4	3-7/16	F	SR	3	1	6-3/4	SCL	2-5/8	1-3/8	34-1/2	92	..	4	SCL	2-5/8	7-1/8	.....	3rd	6	B-R-R-V	775	47
AL	5-9/16	1-3/8	3-7/8	F	SR	3	1	10-1/4	SCL	2-5/8	2	45	186	12	7	SCL	3-1/4	15-1/2	50.4	7th	18	B-R-R-C-V	1790	48
AL	4.895	1-1/8	.....	F	SR	3	2	9-1/4	SCL	2-1/2	1-13/16	.....	.....	..	7	SCL	3-1/4	11-11/32	3687	.....	14	C-M-R-T-W	.....	49
AL	4-13/32	1-3/16	3-41/64	F	..	3	1	8-1/32	SCL	2-7/16	1-13/32	46-7/8	.....	..	7	SCL	3-7/8	.....	.....	4th	14	.....	1637	50
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	52-15/16	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2595	51
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	50-1/2	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2580	52
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	52-15/16	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2775	53
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	52-15/16	.....	..	7	SCL	4-1/2	13.6	61.75	7th	28	C-M-R-V-W	*2775	54
CI	6-1/4	2	4-3/32	F	SCL	3	2	12	SCL	3-1/8	2-3/8	50-1/2	.....	..	7	SCL	4-1/2	13.6	61.75	7th	28	C-M-R-V-W	*2395	55
AL	6-1/4	2	4-3/32	F	SR	3	2	12	SCL	3-1/8	2-3/8	52-15/16	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2480	56
CI	5.04	1-1/2	3-5/8	F	SR	3	2	9.5	SCL	2-5/8	2	41-1/4	.....	..	7	SCL	3-7/8	8.7	33.64	7th	28	C-M-R-V-W	*1440	57
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	50-1/2	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2450	58
AL	6-1/4	2	4-3/32	F	SR	3	2	12	SCL	3-1/8	2-3/8	50-1/2	.....	..	7	SCL	4-1/2	13.6	61.15	7th	28	C-M-R-V-W	*2580	59
AL	6-3/4	1-1/2	3-7/8	F	SR	3	1	9.5	SCL	2-5/8	2	41-1/4	.....	..	7	SCL	3-7/8	8.7	33.64	7th	12	C-M-R-V-W	1545	60
AL	6-1/4	2	4-3/32	F	SR	3	2	12	SCL	3-1/8	2-3/8	52-15/16	.....	..	7	SCL	4-1/2	13.6	61.75	7th	28	C-M-R-V-W	2775	61
AL	6-5/8	1.65	4.20	R	SR	3	2	10-1/2	Tri-M	3	2.20	45.0	X	12	7	Tri-M	3.5	14.25	49.87	Ctr	6-1/2	C-M-R-I-TG-V	1680	62
AL	.....	1.65	4.20	R	SR	3	2	10-1/2	Tri-M	3	2.20	45.9	.....	12	7	Tri-M	3.5	14.25	49.87	Ctr	6-1/2	C-M-R-I-TG-V	1680	63
MI	6	1-1/2	3.62	F	SR	4	2	10-1/8	Tri-M	2-3/4	1-25/32	34-15/16	130	5	5	Tri-M	3-1/2	5-5/8	19.69	5th	21	A-CI-M-R-V-W	1340	64
MI	6	1-1/2	3.62	F	SR	4	2	10-1/8	Tri-M	2-3/4	1-25/32	34-15/16	130	4	5	Tri-M	3-1/2	5-5/8	19.69	5th	21	A-CI-M-R-V-W	1300	65
MI	6	1-1/2	3.62	F	SR	4	2	10-1/8	Tri-M	2-3/4	1-25/32	46-7/16	163	4	7	Tri-M	3-1/2	7-7/8	27.57	7th	25	A-CI-M-R-V-W	1700	66
MI	6	1-1/2	3.62	F	SR	4	2	10-1/8	Tri-M	2-3/4	1-25/32	46-7/16	183	4	7	Tri-M	3-1/2	7-7/8	27.57	7th	25	A-CI-M-R-V-W	1700	67
MI	6	1-1/2	3.62	F	SR	4	2	10-1/8	Tri-M	2-3/4	1-25/32	46-7/16	163	4	7	Tri-M	3-1/2	7-7/8	27.57	7th	25	A-CI-M-R-V-W	1700	68
AL	4-1/32	1-1/8	3	F	SR	3	2	7-3/4	SCL	2-3/8	1-1/2	32-9/16	.....	..	7	SCL	2-3/4	10-15/16	30	7th	10	A-CI-M-R-V-W	805	69
AL	4-1/32	1-1/8	3	F	SR	3	2	7-3/4	SCL	2-3/8	1-1/2	32-9/16	.....	..	7	SCL	2-3/4	10-15/16	30	7th	10	A-CI-M-R-V-W	805	70
AL	6-7/8	1-3/16	3-7/32	F	SR	4	2	8	SCL	3-1/2	1-25/32	38-7/16	.....	..	7	SCL	3.8	10.29	30.82	7th	14	A-CI-M-R-V-W	950	71
AL	6-27/32	1-1/2	3-5/8	F	SR	3	2	8-1/2	SCL	2-3/4	1-7/8	30	.....	..	7	SCL	3-1/2	11.59	48.5	7th	15	A-CI-M-R-V-W	1370	72
AL	6-27/32	1-1/2	3-5/8	F	SR	3	2	8.50	SCL	2-3/4	1-7/8	39	.....	..	7	SCL	3.5	11.59	48.5	7th	22	A-CI-M-R-V-W	1375	73
AL	6-27/32	1-5/8	3-3/4	F	SR	4	2	9-1/8	SCL	3	2	41	.....	..	7	SCL	3-1/2	13.25	46.4	7th	15	A-CI-M-R-V-W	1600	74
AL	6.84	1.6	3.84	F	SR	4	2	9-3/8	SCL	3	2	41	.....	..	7	SCL	3-1/2	13.25	46.4	7th	15	A-CI-M-R-V-W	1880	75
AL	6-27/32	1-5/8	3-15/16	F	SR	4	2	9.37	SCL	3	2	41-5/8	.....	..	7	SCL	3.5	13.25	46.47	7th	15	A-CI-M-R-V-W	1640	76
AL	7-13/32	2	4-21/32	F	SR	4	2	12	SCL	3-5/16	2-1/2	53-1/16	.....	..	7	SCL	4.5	17	76.5	7th	28	A-CI-M-R-V-W	2580	77
AL	7-17/32	2	4-21/32	F	SR	4	2	12	SCL	3-5/16	2-1/2	53-1/16	.....	..	7	SCL	4.5	17	76.5	7th	28	A-CI-M-R-V-W	2580	78
AL	7-17/32	2	4-21/32	F	SR	4	2	12	SCL	3-5/16	2-1/2	53-1/16	.....	..	7	SCL	4.5	17	76.5	7th	28	A-CI-M-R-V-W	2580	79
AL	7-17/32	2	4-29/32	F	SR	3	2	12	SCL	3-5/16	2-1/2	53-1/16	.....	..	7	SCL	4-1/2	17	76.5	7th	28	A-CI-M-R-V-W	2680	80
AL	7-17/32	2	4-29/32	F	SR	3	2	12	SCL	3-5/16	2-1/2	53-1/16	.....	..	7	SCL	4-1/2	17	76.5	7th	28	A-CI-M-R-V-W	2680	81
AL	5.660	1.62	4.22	F	SR	3	2	11-7/16	SCL	3	1-29/32	44-7/16	288	12	7	SCL	4	10-45/64	43-13/16	4th	225	AC-M-R-V-W	1842	82
AL	5.62	1.62	433	F	AP	3	2	11-7/16	SCL	3	1-29/32	44-11/16	298	12	7	SCL	4	10-45/64	42-13/16	4th	33	AC-M-R-V-W	2222	83
AL	4-15/16	1-1/2	3-5/8	F	SR	3	1	9-1/2	SCL	3	1-5/8	39-1/2	X	6	7	SCL	3-1/4	15	48.75	7th	12	B-R-R-C-V	1306	84
AL	4-15/16	1-1/2	3-5/8	F	SR	3	1	9-1/2	SCL	3	1-5/8	39-1/2	X	6	7	SCL	3-1/4	15	48.75	7th	12	B-R-R-C-V	1306	85
AL	7-1/4	1-7/8	4-1/2	F	SR	4	2	11-3/4	SCLB	3-3/8	2-1/4	50-1/4	X	4	7	SCL	4-1/4	10-1/16	76.77	4th	20	C-I-M-R-W	2120	86
AL	7-1/4	1-7/8	4-1/2	F	SR	4	2	11-3/4	SCLB	3-3/8	2-1/4	50-1/4	X	4	7	SCL	4-1/4	10-1/16	76.77	4th	20	C-I-M-R-W	2445	87
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	52-15/16	312	12	7	SCL	4-1/2	13.6	61.15	7th	28	A-C-I-M-R-V-W	2285	88
AL	6-1/4	2	4-3/32	F	SR	3	1	12	SCL	3-1/8	2-3/8	52-15/16	312	12	7	SCL	4-1/2	13.6	61.15	7th	28	A-C-I-M-R-V-W	2295	89

*With Accessories. **Stellite Faced.

KEY TO ABBREVIATIONS

Wrist Pin Bearing Location
F – Floating
P – In piston
R – In rod

Wrist Pin Retainers
AP – Aluminum Plugs
SR – Snap rings

Materials
A – Austenitic Steel
AL – Aluminum Alloy not otherwise noted.
C – Cast-iron
CA – Cast alloy EA-S
CLD – Copper-lead upper Durex lower bg. shell
CIA – Cast Iron Alloy
CN – Chrome nickel
CS – Carbon steel
CSi – Chrome-Silicon
CV – Chrome vanadium
Du – Durachrome
Dus – Duitis
EFS – Electric furnace steel
Fa – Faced steel
FS – Forged steel
M – Malleable iron
M – Molybdenum
MC – MChrome Steel
N – Nickel
PN – Mack permalit nitRonite
PS – Pressed steel
S – Steel not otherwise specified
SA – Steel alloy
Sil – Silchrome
SPA – Special Alloy
Sts – Stainless steel
Stellt – Stellite
Sti – Sterlite
TS – Tungsten Steel

1954 AXLE SPECIFICATIONS

Line	MAKE	MODEL	Final Drive	FINAL RATIOS: No. of Optional Ratios	FINAL RATIOS: Fastest Ratio	FINAL RATIOS: Slowest Ratio	DRUMS: Drum Material	DRUMS: Drum Weight – Lbs.	DRUMS: Rear Drum Diameter (Ins.)	LINING: Type of Lining	LINING: No. Pieces	LINING: Riveted or Bolted	LINING: Lining Width (Inches)	LINING: Lining Thickness (Inches)	LINING: Lining Area (Sq. In.) Rear Axle Only	LINING: Lining Area (Sq. In.) Front Axle Only	LINING: Lining Area (Sq. In.) Hand Brake Only	AXLE SHAFT: No. and Type of Splines	AXLE SHAFT: Is Axle Shaft Splined at Both Ends	AXLE SHAFT: Body Diameter of Axle Shaft – Inches	AXLE SHAFT: Type Material in Rear Axle Housing – See Footnote Abbreviations	REAR AXLE BEARINGS: Bevel Pinion Arrangement – Conventional or Straddle	REAR AXLE BEARINGS: Type Bearing at Bevel Pinion – Outer End	REAR AXLE BEARINGS: Type Bearing at Bevel Pinion – Inner End	REAR AXLE BEARINGS: Type Differential Side Bearing	FRONT AXLE: Top Knuckle Pin Bushing – Diameter and Length	FRONT AXLE: Bottom Knuckle Pin Bushing – Diameter and Length
1	ACF-Timken 3C-41A, 1C-41AD	R117-W	Hy	3	3-7 10	4-5/8	CIA	....	16-1/2	M	8	B	5 & 8	3/4	553	346	127	16 Str	No	2-3/32	F Ba	S	TR	R	TR	2-1/8x2-11/64	2-1/8x2-11/64
2	ACF-Timken C31, SU-37	S6434-W	SB	3	5/27	6-1/6	CIA	....	14-1/2	M	8	B	4 & 6	3/4	298	235	86	16 Str	No	1-11/16	C Ba	S	2TR	R	TR	1-3/8x2	1-3/8x2
3	ACF-Timken C-51	A-110-W	Hy	2	5/27	6-1/6	CIA	....	16-1 2	M	8	B	5 & 8	3/4	555	346	127	16 Str	No	2-3 32	F Ba	S	TR	R	TR	2-1/8x2-11/64	2-1/8x2-11/64
4	ACF-Timken C-48	R-110-DPA	Hy	1	5 47	5-4/7	CIA	....	15	M	16	R	6 & 9	3/4	500	339	127	16 Str	No	2-1/8	F Ba	S	TR	R	TR	1-3/4x2-1/4	1-13/16x2-1/4
5	Beaver	27P H-110	Hy		4.11	....	CIA	....	16-1/2	M	..	..	5	3/4	342	269	....	....	..	.....	....	..	..	..	..	.....	.....
6	Beaver	35PT-L-110	Hy	..	4.11	....	CIA	....	15	M	..	..	7	3/4	400	222	....	....	..	.....	....	..	..	..	..	.....	.....
7	Beaver-Timken	Q-110	Hy	2	6-1/6	6-5/6	CIA	....	16-1/2	M	8	R	7	3/4	461	278	....	16 Str	No	1-7/8	WS	S	TR	R	TR	.....	.....
8	Beck – Timken	L-110-P	Hy	X	....	5.28	CIA	....	16-1/2	M	4	R	6	3/4	444	295	110	2-16	No	1-3/4	C Ba	..	..	..	..	.....	.....
9	Beck – Timken	Q-110	Hy	.	4.62	4.62	CIA	....	15	M	8	R	7	3/4	461	...	69	16 Str	No	1-7/8	WS	S	TR	R	TR	.....	.....
10	Fitzjohn-Timken	S6434-WX-3	SB	3	5-2/7	6-1/6	CIA	78	14-1/2	M	8	B	4 & 6	3/4	338	248	85	16 Str	No	1-11/16	C Ba	S	2TR	R	TR	1-3/8x2	1-3/8x2
11	Fitzjohn-Timken	S6430-WX-1	SB	3	4-6/7	5-5/6	CIA	53	14-1/2	M	8	R	4	3/4	248	248	88	16 SL	No	1-5/16	FS	TR	TR	TR	TR	.....	.....
12	Fitzjohn-Timken	L-110-DPA-X-7	Hy	1	4-1/9	4-1/9	CIA	84-1/2	15	M	8	R	4-1/2&7	3/4	374	240	126	16 Str	No	2-1/16	P Ba	S	TR	R	TR	1-5/8x2-1/16	1-5/8x2-1/16
13	Fitzjohn-Timken	H-110-PX-17	Hy	3	5-2/7	6-4/5	CIA	....	16-1/2	M	4	R	5	3/4	518	416	88	16 SL	No	1-21/32	FS	TR	TR	TR	TR	.....	.....
14	Fitzjohn-Timken	S4430-W-X-1	SB	3	4-6/7	5-5/6	CIA	....	14-1/2	M	4	R	6	3/4	248	248	88	16 SL	No	1-9/16	FS	TR	TR	TR	TR	.....	.....
15	Flxible-Timken	FD-900-DPA-X-102	..	..	.....	.....	CIA	....	.....	M	4	R	4-1/2	3/4	...	248	....	.....	..	.....	.....	..	..	..	..	1-7/16x2-1/8	1-7/16x2-1/8
16	Flxible-Timken	H-110-DPA-X-11	Hy	3	4-5/8	6-1/6	CIA	....	15	M	4	R	6	3/4	338	...	45	16 Ang	No	1-21/32	FS	S	TR	TR	TR	.....	.....
17	Flxible-Twin Coach Timken	R-110-W	Hy	5	4-5/8	7-1/5	CIA	....	16-1/2	M	8	R	7	3/4	483	312	64	16 SL	No	1-7/8	FS	S	TR	R	TR	1.79x2-3/16	1.79x2-3/16
18	Flxible-Twin Coach Timken	L-110-W	Hy	6	3	7-1/5	CIA	....	16-1/2	M	8	R	6	3/4	414	312	64	16 SL	No	1-3/4	FS	S	TR	R	TR	1.79x2-3/16	1.79x2-3/16
19	G.M. Coach-Timken	PD-4104	SB	2	3.56	4.125	CIA	129	14-1/2	M	2	B	F 5, R 8	3/4	470	294	125.5	16 Str	No	2-3/32	P Ba	S	TR	R	TR	1.79D. 2-3/16 L.	1.79D. 2-3/16 L.
20	G.M. Coach-Clark	TGH-3102	SB	2	5-4/7	6-2/6	CIA	96	14-1/2	M	2	B	F 4, R 6	3/4	372	248	29	16 Str	No	1-11/16	P Ba	S	TR	R	TR	1-1/2x2	1-1/2x2
21	GMC-Timken	TDH-3714	SB	3	4.125	5.17	CIA	125	14-1/2	M	2	B	F 4, R 7	3/4	411	235	69	16 Str	No	2-3/32	P Ba	S	TR	R	TR	1.68 D. 2.125 L.	1.68 D. 2.125 L.
22	GMC-Timken	TDH-4512	SB	3	4.125	5.17	CIA	135	14-1/2	M	4	B	F 4, R 8	3/4	470	235	104	16 Str	No	2-3/32	P Ba	S	TR	R	TR	1.79 D. 2-3/16 L.	1.79 D. 2-3/16 L.
23	GMC-Timken	TDH-4515	SB	3	3.55	4.125	CIA	135	14-1/2	M	4	B	F 4, R 8	3/4	470	235	104	16 Str	No	2-3/32	P Ba	S	TR	R	TR	1.79 D. 2-3/16 L.	1.79 D. 2-3/16 L.
24	GMC-Timken	TDH-5105	SB	2	4.71	5.17	CIA	185	14-1/2	M	4	B	F 5, R 16	3/4	580	294	104	16 Str	No	2-3/32	P Ba	S	TR	R	TR	1.79 D. 2-3/16 L.	1.79 D. 2-3/16 L.
25	GMC-Timken	TDH-5106	SB	2	4.71	5.17	CIA	146	14-1/2	M	4	B	F 5, R 16	3/4	580	294	104	16 Str.	No	2-3/32	P Ba	S	TR	R	TR	1.79 D. 2-3/16 L.	1.79 D. 2-3/16 L.
26	GMC-Timken	TDH-5108	SB	2	3.875	4.125	CIA	146	14-1/2	M	4	B	F 5, R 16	3/4	580	294	104	16 Str.	No	2-3/32	P Ba	S	TR	R	TR	1.79 D. 2-3/16 L.	1.79 D. 2-3/16 L.
27	Mack	RAS-502	SB	2	4.44	4.88	CIA	259	16-1/2	M	RF 16R	B	F.6 R.10	3/4	680	400	139	17 Inv.	Yes	1.937	P Ba	S	TR	TR	TR	1.546 D. 2-5/8 L.	1.859 D. 2-5/8 L.
28	Mack	RAS-1031	SB	2	3.73	4.20	CIA	188	16-1/2	M	RF 16R	B	F.5 R.9	3/4	544	340	139	17 Inv.	Yes	1.937	P Ba	S	TR	TR	TR	1.343 D. 2-3/16 L.	1.625 D. 2-3/16 L.
29	Mack	RAS-1961	SB	3	5.11	6.14	CIA	199	15	M	RF 16R	B	F 4-1/4 R.8-1/2	3/4	493	246.5	61	18 Inv.	Yes	1.771	P Ba	S	TR	TR	TR	1.247 D. 2-3/16 L.	1.513 D. 2-3/16 L.
30	Mack	RAS-462	SB	4	3.31	4.78	CIA	199	15	M	RF 16R	B	F 5 R.9-1/2	3/4	493	291	139	17 Inv.	Yes	1.937	P Ba	S	TR	TR	TR	1.247 D. 2-3/16 L.	1.513 D. 2-3/16 L.
31	Marmon-Herrington-Timken	53509	SB	2	5.83	6.67	CI	....	14.5	M	B	B	.....	3/4	224	224	80.4	16 Str	No	1.57	C Bo	S	2TR	R	TR	.....	.....
32	Reo-Timken	37-CA-L-110	Hy	1	5.26	6.80	CIA	....	16-1/2	M	..	..	F.4, F.6	3/4	342	290	....	15	No	1-21/32	F Ba	S	TR	R	TR	1-1/2 L, 2 D.	.....
33	Southern-Timken	Q-110-DPA	Hy	5	4-5/8	7-4/5	CIA	191	15	B	4	R	F.6-1/2 F.7	3/4	397	254	101	16 Str	No	1-4/8	WS	S	TR	R	TR	1.615x2-3/8	1.615x2-3/8
34	Southern-Timken	L-110-DPA	Hy	5	4-1/9	7-1/5	CIA	191	15	M	4	R	F 4-1/2 R.7	3/4	397	254	34	16 Str	No	1-3/4	WS	S	TR	R	TR	1.615x2-3/8	1.615x2-3/8
35	Transit Buses-Clark	R (R-1091)	Hy	1	6.333	6.333	CIA	90	14-1/2	M	B	B	6	3/4	350	....	78	16 Inv.	No	1-1/2	CBA	S	TR	R	TR	1-1/4x1-15/16	1-1/4x1-13/16
36	Transit Buses-Clark	F (F-562-1)	..	..	.....	.....	CIA	75	14-1/2	M	B	B	4	3/4	...	235	....	.....	..	.....	.....	..	..	..	..	.....	.....
37	Transit Buses-Clark	R (R-1502)	Hy	1	5.867	5.867	CIA	110	14-1/2	M	B	B	7	3/4	425	...	45	24 Inv.	No	1-13/16	CBA	S	TR	R	TR	1-5/8x2-1/8	1-5/8x2-1/8
38	Transit Buses-Clark	F (F-832)	..	..	.....	.....	CIA	90	14-1/2	M	B	B	4	3/4	...	235	....	.....	..	.....	.....	..	..	..	..	.....	.....
39	Twin Coach-Timken	Q-110-W	Hy	5	4-5/8	7-1/5	CIA	....	16-1/2	M	B	R	7	3/4	483	312	64	16 SL	No	1-7/8	FS	FS	TR	R	TR	1.79x2-3/16	1.79x2-3/16
40	White	330	..	..	.....	.....	GI	....	15	M	A	B	5	3/4	....	346	....	.....	..	.....	.....	..	..	..	..	1.42x2	1.42x2
41	White	80C	SB	5	4.88	6.67	GI	....	15	M	4	B	7-1/2	3/4	472	....	123	20 SL	No	2-1/4	C Bo	S	TR	R	TR	1.79 a 2-3/16	1.79 a 2-3/16
42	White	126-CA	SB	5	4.88	6.67	CIA	....	14-1/2	M	8	B	10	3/4	588	....	112	28	No	2-3/8	F BA	S	TR	R	TR	1.79 a 2-3/16	1.79 a 2-3/16

KEY TO ABBREVIATIONS

Drum Material
CI – Cast Iron
CIA – Cast Iron Alloy
GI – Gun Iron

Type Bearings
R – Straight Roller
TR – Tapered Roller

Final Drive
HY – Hypoid
SB – Spiral Bevel

Type Brake Lining
W – Molded Lining or block

Type Splines
Ang – Angular
Inv – Involute
SL – Slant Side
Str – Straight

Housing Material
C Ba – Cast Banjo
C Bo – Cast Bowl
C Bu – Cast Built-Up
F Ba – Forged Banjo
FS – Forged Steel
P Ba – Pressed Banjo
P Bo – Pressed Bowl
WS – Welded Steel

Unseen - Quiet
THE CLARK TRANSMISSION
COMPACT
DURABLE
Do you use PRECISION GEARS ? CLARK produces them ...MOST TYPES, MOST SIZES
CLARK EQUIPMENT
CLARK EQUIPMENT COMPANY • BUCHANAN • Battle Creek, Benton Harbor and Jackson, Michigan

"Here's why we swear by Clark fork trucks—we handle 50% more volume with half as much effort"

EDWIN L. BURT, GENERAL MANAGER, RESERVE SUPPLY CORP., FRANKLIN PARK, ILL.

Insofar as possible, by prearrangement with suppliers, all shipments to Reserve Supply, building material concern dealing with about 300 customers, come in unit loads on pallets. Upon arrival, two Clark Carloaders (4000 lb. gas-powered fork trucks) unload the cars; warehouse the material—tiering as high as 16 feet; and withdraw customer's orders—usually handling the palletized unit loads directly into customers' trucks. Materials consist of building board, insulation, masonite, rock lath, tile and many other items—no lumber.

"A carload of insulation-board sheeting (60,000 square feet)" says Mr. Burt, "is unloaded by one man on a Clark fork truck in just one hour—in contrast to 33 man-hours required to do the job by hand. In our old warehouse, some two years ago, 13 of our men were involved in materials handling—no trucks; in our new warehouse, six men and the two Clarks handle a 50% greater volume. We are exceedingly pleased with our Clark machines."

Nothing here, you may say, that can't be done in your business—and you're probably right. Good way to investigate is to ask the nearby Clark dealer, a fully qualified consultant on planning a materials handling system to meet your own specific needs. Call him—he's listed in the Yellow Pages of your phone book.

Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK, MICHIGAN

CLARK EQUIPMENT

PRODUCTS OF CLARK—TRANSMISSIONS • AXLE HOUSINGS • TRACTOR UNITS FORK TRUCKS and TOWING TRACTORS • ROSS CARRIERS • POWRWORKER HAND TRUCKS • POWER SHOVELS • ELECTRIC STEEL CASTINGS • GEARS and FORGINGS • FRONT and REAR AXLES for TRUCKS and BUSES

BLUE BIRD'S

ADVANCED ENGINEERING PRESENTS . . . . . .

Ford Powered City and Inter-City Buses

STANDARD PARTS

Four FORD motors for your choice—

A. Big Six.....254 cu. in. displacement
B. V-8.....239 cu. in. displacement
C. V-8.....279 cu. in. displacement
D. V-8.....317 cu. in. displacement

Standard Ford parts are available everywhere.

SHORT WHEEL BASE

Short wheel base provides shorter turning radius.

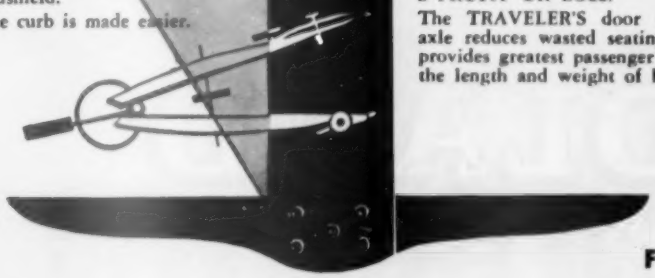
Added distance from front axle to bumper allows the driver more time to stop in case of pedestrian collision.

DRIVER'S WATCH TOWER

The driver's seat in the TRAVELER is located in the extreme forward position which affords excellent, unobstructed visibility—the best assurance against collision.

There is no wasted seating space between driver and windshield.

Approach to the curb is made easier.



EASIER RIDING

Balanced load results in easy riding. The long extension of the TRAVELER body over the front and rear axles makes the difference.

WIDE TREAD FRONT AXLE makes steering easier—gives better road stability.

FRONT POSITION MOTOR

PROVIDES—

Unexcelled cooling.
Driver awareness of motor condition.
Best position for servicing.
Motor hood does not kill seating space since it parallels front entrance landing.

PROFIT OR LOSS

The TRAVELER has less dead weight and allows LARGER PAY LOADS, which can mean the difference between a PROFIT OR LOSS.

The TRAVELER'S door in front of axle reduces wasted seating space and provides greatest passenger capacity for the length and weight of bus.

UNDER ONE ROOF

All chassis and bodies are MANUFACTURED AND ASSEMBLED under one roof for BETTER QUALITY CONTROL.

Write for catalogue and specifications

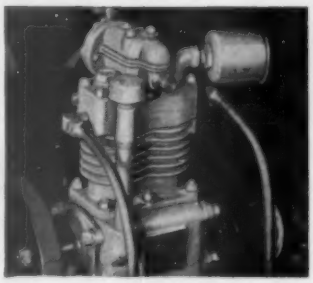
BLUE BIRD BODY COMPANY

FORT VALLEY, GEORGIA

Those Who Know DOOR CONTROLS Choose MIDLAND

WHETHER your design calls for Straight-Air or Electro-Pneumatic operation, Midland Air Door Operating Systems provide time-proved equipment for long-life, high efficiency and low-cost, trouble free service. Midland's complete line includes every safety device required for dependable operation.

LEADING BUS MANUFACTURERS install Midland Air Door Operating Systems as original equipment in their vehicles. Back of this equipment is Midland's twenty years of experience in building the finest, most dependable air brake and allied equipment for motor vehicles. You, too, can depend on Midland.



HUSKY 7¼ and 9½ cubic foot Midland air compressors supply ample *reserve* braking power to meet today's traffic emergencies and operate all pneumatic controls. Unique, *patented* inlet valves provide tremendous output. Governor is integral, operating directly on the inlet valves.

World-wide Distributor Organization to Serve You

WHEREVER YOU ARE, you can have experienced Midland workmen service Midland Door Controls and Power Brakes on your own or your customers' vehicles.

And you can procure genuine Midland parts from your Midland distributor and install them in your own plant or shop.

You profit by working with your Midland Distributor. There are over 250 Midland Distributors in North America alone.

THE MIDLAND STEEL PRODUCTS CO.
3641 E. Milwaukee Ave. • Detroit 11, Mich.
***Export Department:* 38 Pearl St., New York, N. Y.**

MIDLAND

POWER BRAKE EQUIPMENT

AUTOMOBILE AND TRUCK FRAMES

BUS DOOR CONTROLS

***250* Service Organizations To Serve You Wherever You Are**

"DIRTY ENGINES ARE COSTLY ENGINES"

F. J. Hoagland,
Owner,
Elgin Yellow Cab Co.

"My engines were just too dirty when we took them down. And dirty engines are a sure sign you're not getting efficient use out of cabs." So Mr. Hoagland decided to try Phillips *66* Heavy Duty Motor Oil.

Here's what Phillips *66* Heavy Duty Motor Oil is doing for Elgin Yellow Cab Company. First and foremost, as Mr. Hoagland says, "We noticed that our engines were cleaner than before. We didn't get as much low temperature sludge. This alone added up to smoother cab performance and longer engine life." Overhaul has been stretched out to between 85,000 and 125,000 miles. Now valves are seldom worked over except at overhaul time.

Mr. Hoagland sums it up with, "Phillips *66* Heavy Duty Motor Oil is the best oil I've used. I'm satisfied it helps cut down our maintenance costs and gives us more efficient use of our cabs."

And what this great oil is doing for Elgin Yellow Cab Company, it can do for you. No matter what kind of fleet you operate, investigate—find out how you can take advantage of Phillips *66* Heavy Duty Motor Oil.

Toxicabs traveling some 7,000 miles a month need the protection of top quality Phillips 66 Heavy Duty Motor Oil.

Set up your own test. We will be glad to help you plan it without obligation. Write to Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

Oil for the Engines of Commerce

Phillips 66

PHILLIPS 66 HEAVY DUTY MOTOR OIL

CHICAGO and CALUMET *Goes Gas*

for safe, sure, outside storage of Diesels

When M. A. Norris, Superintendent of Equipment, convinced his management that substantial savings could be made by eliminating winter engine-idling, he went all the way to do a complete job with Vapor "Parka" Heaters.

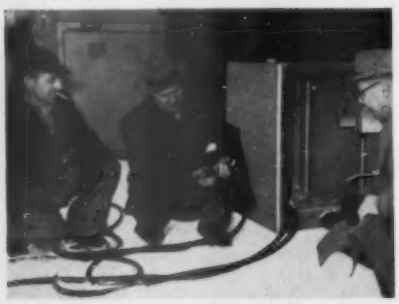
Three basic ideas in this installation have earned these substantial economies:

1. *Selection of Gas-Fired "Parkas" for reliable performance and minimum maintenance with a continuous supply of fuel.*
2. *Efficient use of parking area, with easy access to street and shop.*
3. *Protection of parked coaches from wind by utilizing the shelter provided by adjacent buildings and an additional canvas along the exposed north side of property.*

Over one hundred "PARKAS" are saving time, fuel, taxes, maintenance, and building costs and depreciation for their owners.

With "PARKAS," ruinous engine-idling is a thing of the past, and coaches are warm and ready to go the instant you step on the starter. Phone or write for complete information on this modern winter protection.

M. A. Norris, left, and J. C. Hankins, Purchasing Agent, look over one of their two "Parka" heaters. Side panels remove for easy access, as shown. "Parkas" are equipped with full controls and automatic safety protection; use oil or gas as fuel.



J. C. Hankins examines the self-sealing, plug-and-socket connections of "PARKA" hoses which carry heat to each engine. When not in use, hose-ends connect together, thus maintaining circulation and preventing freezing.

VAPOR HEATING CORPORATION 80 EAST JACKSON BLVD., CHICAGO 4, ILLINOIS

New York • St. Paul • Denver • St. Louis • Atlanta • Washington • Philadelphia • San Francisco • Houston • Jacksonville • Richmond • Montreal • Los Angeles

"I'll be stuck in this diner all night! That's what comes of savin' money on brake blocks!"

Are breakdowns and brake repairs boosting *your* cost-per-mile? Grey-Rock *balanced* brake blocks can shrink this expense surprisingly. Next to tires, brakes are the most costly item in bus fleet maintenance—and Grey-Rock often cuts this cost materially. Reason: for every make and model Grey-Rock combines just the right materials to equalize wear in blocks—to maintain balance between shoes in the same wheel and between front and rear axles. Results: more thousands of miles between relines—avoidance of costly drum replacement—on-schedule operation—lower maintenance costs—all adding up to lowest cost per mile. Let your Grey-Rock jobber show you the facts and figures.

Best to STOP with...
Because they're best
to START with

Only Grey-Rock *makes*

BALANCED BRAKSET LININGS

BALANCED BRAKSETS • TRUCKSETS • BRAKE BLOCKS • VEE-LOK® CLUTCH FACINGS

RM

GREY-ROCK DIVISION of Raybestos-Manhattan, Inc., MANHEIM, Pa.

RAYBESTOS-MANHATTAN, INC., Brake Linings • Brake Blocks • Clutch Facings
Fan Belts • Radiator Hose • Industrial Rubber, Engineered Plastic, and Sintered Metal Products
Rubber Covered Equipment • Asbestos Textiles • Packings
Abrasive and Diamond Wheels • Bowling Balls

The Real Answer...

Yes...

YOU TOO CAN OPERATE DECK AND HALF EQUIPMENT

•

ASK US TO PROVE IT

•

To More Revenue... To More Net Profit

Modern transportation means just that—to get "them" in . . . to get more passengers riding further and paying you more, you have to provide MODERN BUSES.

The railroads with Superchiefs—the airlines with Super Constellations and all other forms of transportation know that passengers come easier when the equipment is new, novel, safe and super comfortable. There's no denying this—it will prove out on your line, on any line, anywhere.

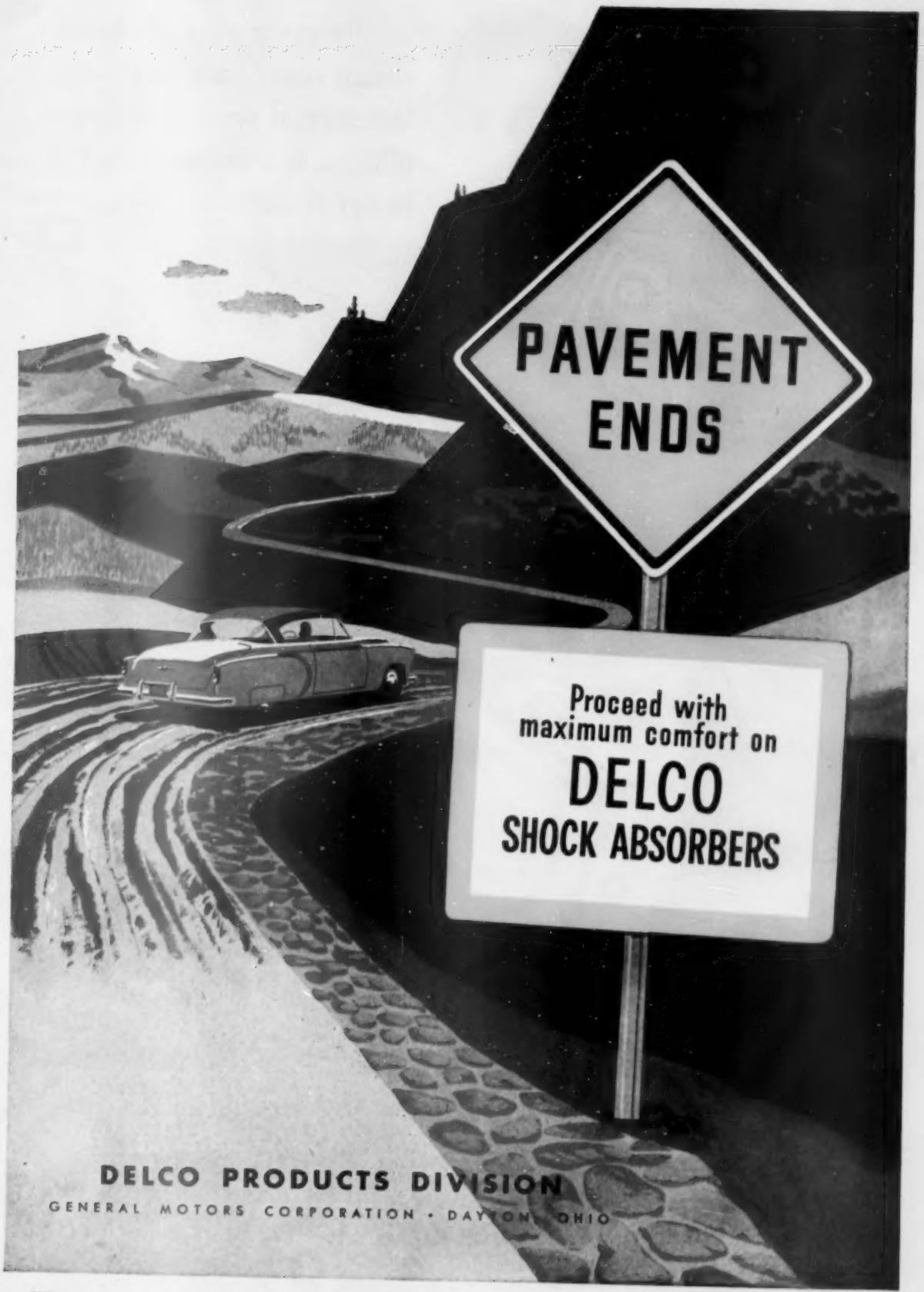
We have the facts and figures from operations using Beck Super Deck and Halfs anywhere from one to three or more years—phone, wire or write for actual operating data.

Don't delay—go Modern—go Beck Deck and Half.

BECK **BM-37 Diesel Coaches are also in BIG demand in Cuba and South America**

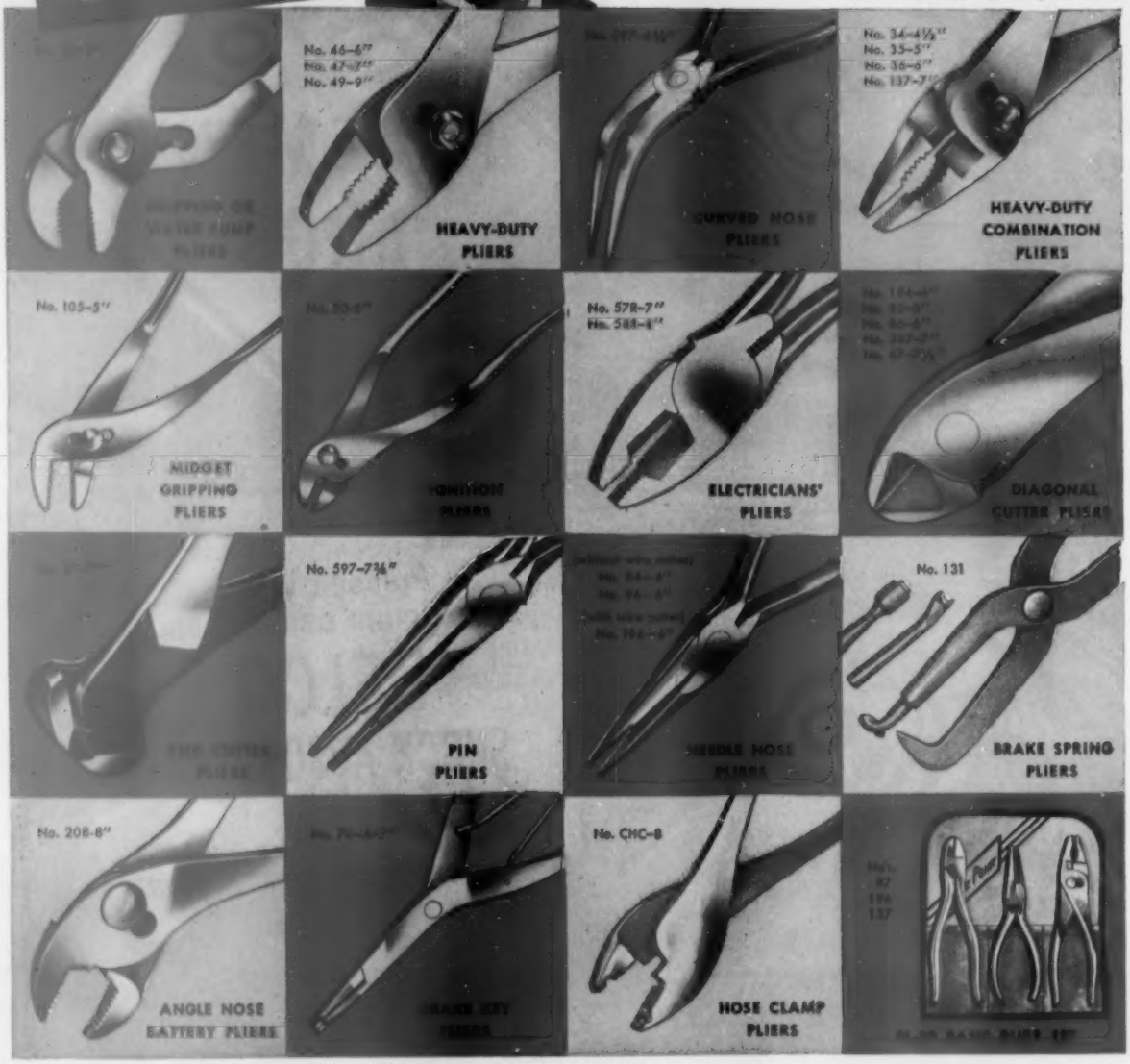
Above—A recent shipment CIA. Interdepartmental Transportes Automotores, Montevideo, Uruguay—a long time customer

C. D. BECK & COMPANY, INC., SIDNEY, OHIO, U.S.A.


PAVEMENT
ENDS
Proceed with
maximum comfort on
DELCO
SHOCK ABSORBERS
DELCO PRODUCTS DIVISION
GENERAL MOTORS CORPORATION • DAYTON, OHIO

Snap-on* VACUUM GRIP PLIERS

..."handle every plier job faster, easier, safer...and they'll outlast several pairs of ordinary pliers...SNAP-ONS are favorites in our shop." Robert W. Rumpf, Service Manager, S-W-S Chevrolet Co., Dayton, Ohio



SNAP-ON PLIERS are better because they are built to the most exacting standards that specialized engineering, advanced metallurgy and painstaking skill can produce. Jaws, cutting edges and joints are locally hardened to give exact degree of toughness for greatest durability. Look them over—handle them—*try them* next time your Snap-on man calls! For 104-page catalog of 4000 Snap-on tools, write...

SNAP-ON TOOLS CORPORATION

8040-B 28th Avenue, Kenosha, Wisconsin

*Snap-on is the trademark of Snap-on Tools Corporation

Design that has never stood still

(Another reason why Timken® bearings are first choice with bus manufacturers)

EVER since we pioneered the tapered roller bearing back in 1899, we've never let ourselves become complacent about our designs.

The Timken® bearing of today is a thousand miles ahead of the first one—only because we've never stopped looking for ways to take another step ahead. Look at the picture: these are just a few of the stages on this long, progressive journey.

Among the Timken Company's many design "firsts" is the one-piece perforated cage that assures exact spacing of rollers.

Only Timken bearings give you 1) advanced design, 2) precision manufacture, 3) rigid quality control and 4) special analysis Timken steels. Be sure your replacement bearings carry the trade-mark "Timken". Send now, on your company letterhead, for free booklet: "Timken Tapered Roller Bearings, Their Care and Maintenance". Dept. TB-2, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

SINCE THEY'RE BEST WHEN THE BUS IS NEW, THEY'RE BEST FOR REPLACEMENT, TOO!

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↕ AND THRUST →↕← LOADS OR ANY COMBINATION

MARMON-HERRINGTON

• *Now in service on 175 properties in 38 states, Canada, Alaska, Colombia and Puerto Rico*

The map on the right shows the location of properties where Marmon-Herrington transit vehicles are currently in service.

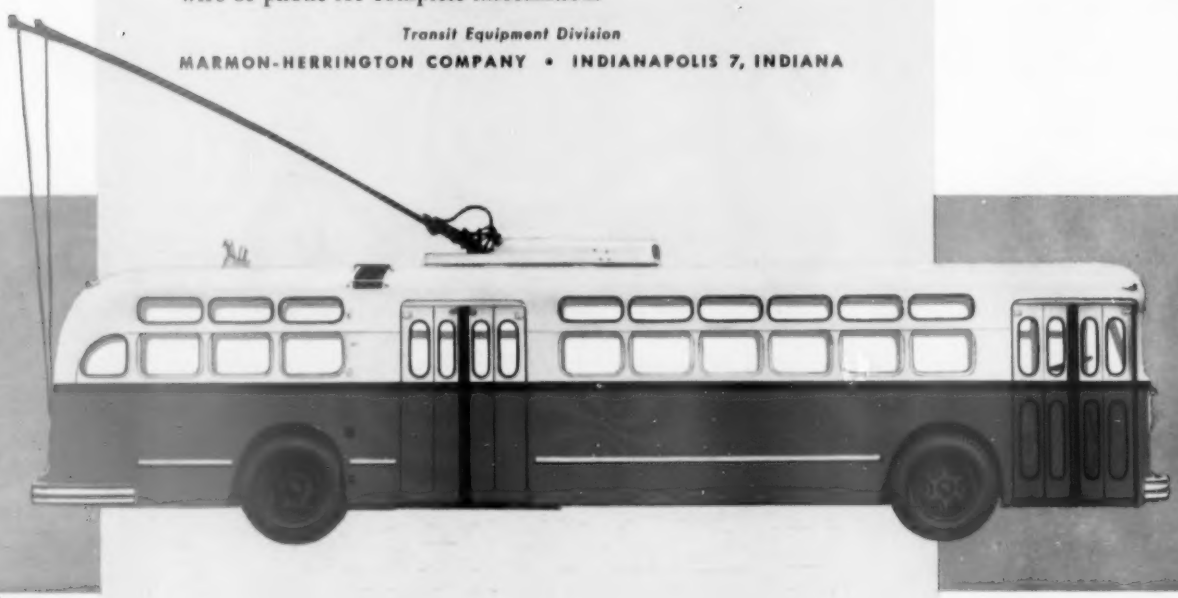
Such nation-wide acceptance means but one thing: Marmon-Herrington transit vehicles—both trolley coaches and motor coaches—are delivering the kind of transportation that makes both owners and riders happy.

Marmon-Herrington has achieved this dominant position by doing the things expected of a leader. For example, Marmon-Herrington was first with a completely modern design for transit vehicles, combining light weight with exceptional structural strength. Result: lower operating and maintenance costs, easier handling, more comfortable riding, better appearance. And Marmon-Herrington is the only motor coach manufacturer with a nation-wide distributor organization. You get fast, overnight parts and repair service.

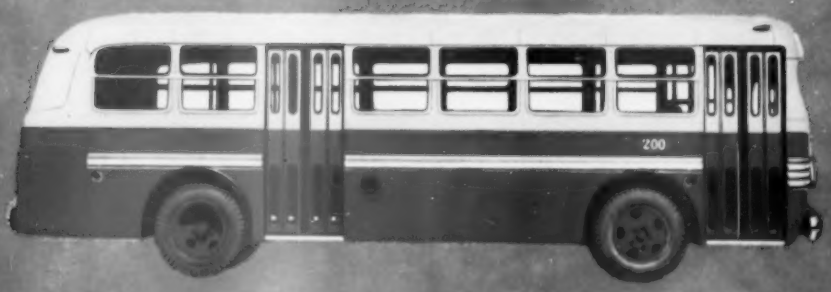
If you are looking for the utmost in operating efficiency, economy and rider satisfaction, it will pay you to investigate Marmon-Herrington Trolley Coaches and Motor Coaches. Write, wire or phone for complete information.

Transit Equipment Division

MARMON-HERRINGTON COMPANY • INDIANAPOLIS 7, INDIANA



SPANS THE NATION!



MARMON - HERRINGTON

Transit Equipment

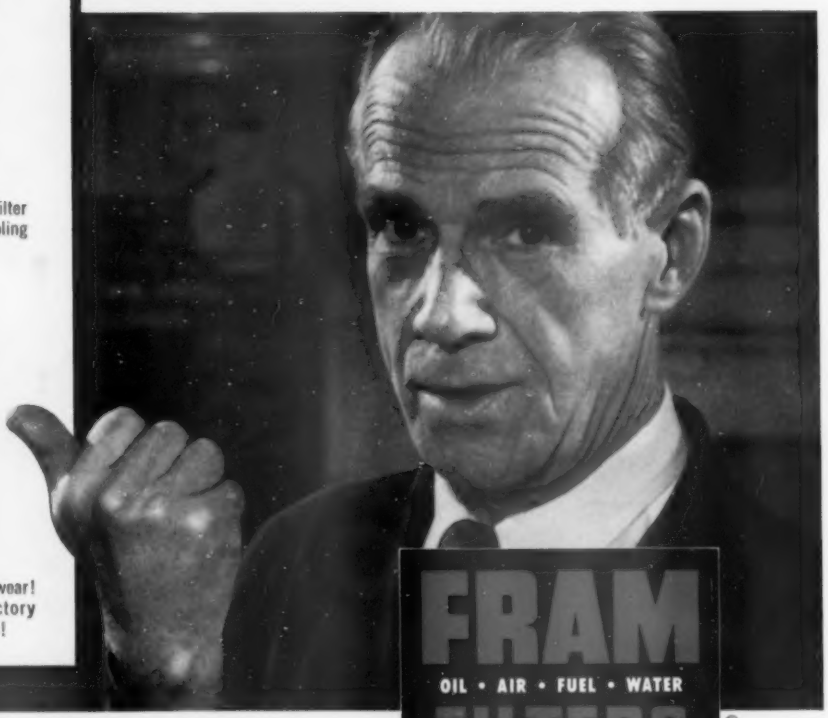
FRAM BEST FOR ANY FLEET

cuts operating costs, maintenance, repairs!

Keep your fleet out of the shop and on the road with FRAM—guaranteed your best bet for longer service at less cost per mile!

FRAM Radiator & Water Filter stops overheating . . . ends cooling system troubles!

FRAM Cartridges cut engine wear! Custom-engineered to factory standards for all your engines!



FRAM CORPORATION, Providence 16, R. I.
Fram Canada Ltd., Stratford, Ont.

FOR GREATER SAFETY

VICKERS *Greyhound Specified* HYDRAULIC POWER STEERING

700* on 400 New Coaches

*Order has been increased to 700 buses

Always searching for ways to further increase passenger safety, Greyhound Lines selected Vickers Hydraulic Power Steering for the ~~400~~ 700* new Model PD-4104 GM Coaches recently purchased.

Vickers Hydraulic Power Steering prevents the possible loss of driver control when a vehicle is forced off the pavement onto a soft shoulder . . . or when a front tire blows out. Extra steering power and quick maneuverability are always available for emergency conditions.

The Vickers System absorbs all road shock and transmits it to the vehicle frame . . . there can be no kick-back at the steering wheel. The driver supplies only enough effort to slightly move a servo valve . . . fatigue is thus greatly reduced and the driver is more alert.

Only minor alterations are usually required to incorporate Vickers Hydraulic Power Steering in new and existing vehicle designs. For further information, ask for new Bulletin M-5104.

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1408 OAKMAN BLVD. • DETROIT 32, MICH.
Application Engineering Offices: ATLANTA • CHICAGO (Metropolitan) CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES (Metropolitan) NEW YORK (Metropolitan) • PHILADELPHIA • PITTSBURGH • ROCHESTER ROCKFORD • SEATTLE • TULSA • WASHINGTON • WORCESTER

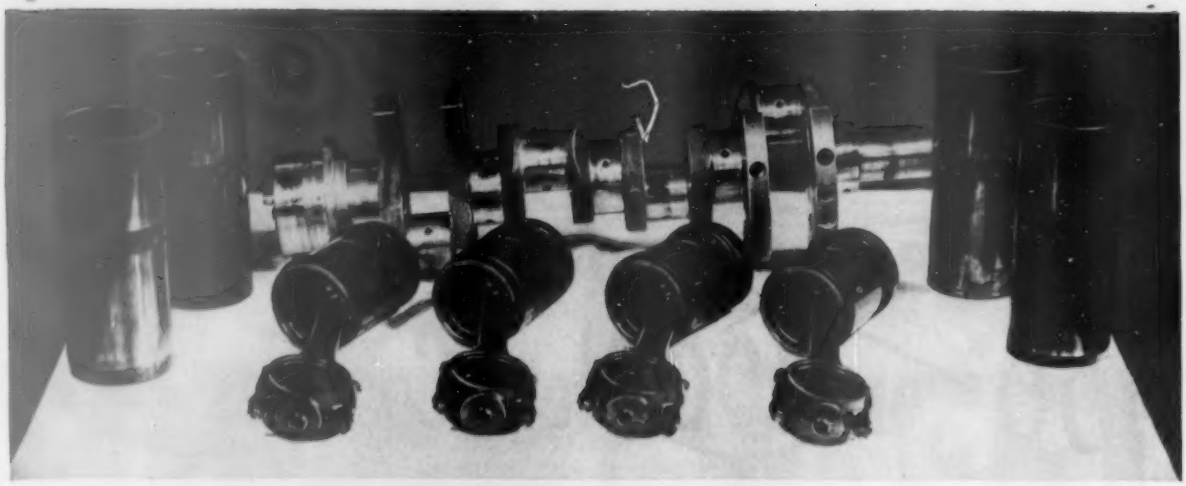
VICKERS hydraulic POWER STEERING
is Effortless
Positive and Shockless

6478

Vickers Hydraulic Power Steering Booster does the actual work of steering

Engine-driven Vickers Vane Pump (with integral volume control and relief valves, and oil reservoir) supplies power for steering.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



"Excellent Condition After 351,905 Miles With Cities Service C-300 Motor Oil!"

LAKESHORE COACH CO., COLUMBUS, OHIO, HAS USED CITIES SERVICE MOTOR OILS, GEAR OILS AND GREASES FOR 20 YEARS!

Lakeshore's bus No. 527 was put in operation November, 1950. Since that time, it has been run with Cities Service Heavy Duty C-300 Motor Oil and Cities Service Gear Oils and Greases. As is Lakeshore's policy, No. 527 got its first engine check and overhaul at 147,794 miles. At that point, rings were replaced and sleeves, pistons and bearings were found okay. Engine check, at 351,905 miles, found only slight wear on cylinder walls, while rings, valves, bearings were in excellent condition!

A tremendous tribute to the extra-high quality of all Cities Service Products! For No. 527, it was stop-and-go driving, hill climbing, long engine-racking straight runs. Under all conditions, Cities Service Oils and Greases protected its vital engine parts. Kept No. 527 a paying proposition.

Besides the money-saving performance of Cities Service Lubricants, Lakeshore enjoyed the valuable services of the Cities Service Heat Prover and Power Prover (see below). For more information, call your nearest Cities Service office or write Cities Service Oil Company, Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE HEAT PROVER MEASURES AIR CONTENT OF DIESEL ENGINE EXHAUST GASES. The Lakeshore Coach Co. uses the Heat Prover to evaluate the air losses of diesel bus engines.

CITIES SERVICE POWER PROVER MEASURES THE COMBUSTION EFFICIENCY OF LAKESHORE'S GASOLENE ENGINES to control combustion for maximum engine power and fuel economy.

Seat No. 66 has completely welded tubular steel frame and chrome rigidized back.

miles and miles of built-in rider comfort

● IT ISN'T THE first mile that points up the tremendous advance forward that Ionia has engineered into bus seating. It's the five-thousandth mile, the ten-thousandth mile—and beyond—and all those long miles stretching out between when the built-in qualities of Ionia Seats pay off in greater profits at the operator level because they return a big dividend in passenger comfort day after day after day. Ask any driver on a bus equipped with Ionia Seats. He has the answer. He sees it in the faces of his passengers—pleasant, relaxed, comfortable. He knows because he's sitting on one too. Automotive manufacturing skills and years of research have brought Ionia Seats to the forefront. Little wonder then that better transit systems everywhere are specifying Ionia Seating!

Ionia **SEATING**

IONIA MANUFACTURING COMPANY

A Division of The Mitchell-Bentley Corporation

AUTOMOTIVE SEATING DIVISION • IONIA, MICHIGAN

Driver's Seat No. 64 has finger-tip control for easy adjustment. Built-in comfort relieves driver fatigue.

Budd Wheel Distributors

AKRON—Motor Rim Manufacturers Co.
ALBANY—Wheels, Incorporated
ALBUQUERQUE—Wheels & Brakes, Inc.
ATLANTA—Harris Automotive Service, Inc.
BALTIMORE—R. W. Norris & Sons, Inc.
BIRMINGHAM—Wheel, Rim & Parts Co.
BOSTON—New England Wheel & Rim Co.
BUFFALO—Frey, the Wheelman, Inc.
CHARLOTTE—Carolina Rim & Wheel Co.
CHICAGO—Stone Wheel, Inc.
CINCINNATI—Rim & Wheel Service, Inc.
CLEVELAND—Motor Rim Manufacturers Co.
COLUMBUS—Hayes Wheel & Spring Service
DALLAS—Southwest Wheel, Inc.
DAVENPORT—Stone Wheel, Inc.
DAYTON—Rim & Wheel Service, Inc.
DENVER—Quinn & McGill Motor Supply Co.
DES MOINES—Des Moines Wheel & Rim Co.
DETROIT—H. & H. Wheel Service, Inc.
EVANSVILLE—Auto Wheel & Rim Service Co., Inc.
FARGO—Wheel Service Company
FORT WAYNE—Wheel & Rim Sales Co.
GRAND RAPIDS—Rim & Wheel Service Co.
HARRISBURG—Standard Wheel & Rim Co.
HARTFORD—Connecticut Wheel & Rim Co.
HOUSTON—Southwest Wheel & Equipment Co.
INDIANAPOLIS—Indiana Wheel & Rim Co.
JACKSONVILLE—Southeast Wheel & Rim Co.
KANSAS CITY—Borbein, Young & Co.
KNOXVILLE—Harris Automotive Service, Inc.

HERE'S WHAT THE SANDMAN SAYS...

Dan Thompson down in Atlanta makes his living hauling sand. He has been doing it, on and off the road, for years with his fleet of trucks. One day he found his tire and wheel costs were getting out of line, and he called in Harris Automotive Service, Inc., his local Budd Wheel Distributor. Let Dan tell it in his own words:

"I was continually plagued with road troubles, difficult handling, and what I considered unnecessary tire problems. My down time was excessive. Finally, I called in Walt Turner, of Harris Automotive Service, Inc. Walt recommended 20x6.50 Budd Wide Base Wheels with tapered bead seats for my 8.25x20 tires.

"I tried it—and it worked! I now plan to equip all my trucks with these Budd wheels as rapidly as possible."

What goes for trucks goes for buses, too. Many a bus line in America's major cities specifies that every vehicle they buy be equipped with Budd wide base wheels. Hour after hour, day after day, mile upon mile, they have proved themselves to be a wise investment—and an economical one, too. If you're having wheel or tire trouble . . . or excessive tire wear . . . why not call your Budd Wheel Distributor below? He'll be glad to survey your equipment and give you his expert advice. He may well help you end the year with a better balance sheet.

Budd

THE BUDD COMPANY • DETROIT 15

LOS ANGELES—Wheel Industries, Inc.
LOUISVILLE—Auto Wheel & Rim Service
LUBBOCK—Southwest Wheel, Inc.
MEMPHIS—Beller Wheel, Brake & Supply Co.
MILWAUKEE—Stone Manufacturing Co.
MOLINE—Mutual Wheel Co.
NASHVILLE—Beller Wheel, Brake & Supply Co.
NEWARK—Automotive Safety Inc.
NEW HAVEN—Connecticut Wheel & Rim Co.
NEW ORLEANS—Southern Wheel & Rim Co.
NEW YORK—Wheels, Incorporated
OKLAHOMA CITY—Southwest Wheel, Inc.
OMAHA—Morgan Wheel & Equipment Co., Inc.
PEORIA—Peoria Wheel & Rim Co.
PHILADELPHIA—Thomas Wheel & Rim Co., Inc.
PITTSBURGH—Wheel & Rim Sales Co.
PORTLAND—Six Robblees', Inc.
PROVIDENCE—New England Wheel & Rim Company
RALEIGH—Carolina Rim & Wheel Co.
RICHMOND—Dixie Wheel Co., Inc.
ROCHESTER—Frey, the Wheelman, Inc.
SALT LAKE CITY—Henderson Rim & Wheel Service
SAN ANTONIO—Southwest Wheel & Equipment Co.
SAN FRANCISCO—Wheel Industries, Inc.
SEATTLE—Six Robblees', Inc.
SOUTH BEND—Wire & Disc Wheel Sales & Service
SPOKANE—Bearing & Rim Supply Co.
SPRINGFIELD, ILL.—Illinois Wheel & Brake Co.
SPRINGFIELD, MO.—Borbein, Young & Co.
ST. LOUIS—Borbein, Young & Co.
ST. PAUL—Wheel Service Co.
SYRACUSE—Colbourn Wheel & Rim Service, Inc.
TACOMA—Six Robblees', Inc.
TOLEDO—Wheel & Rim Sales Co.
WICHITA—Borbein, Young & Co.
WINSTON-SALEM—United-Automotive Service

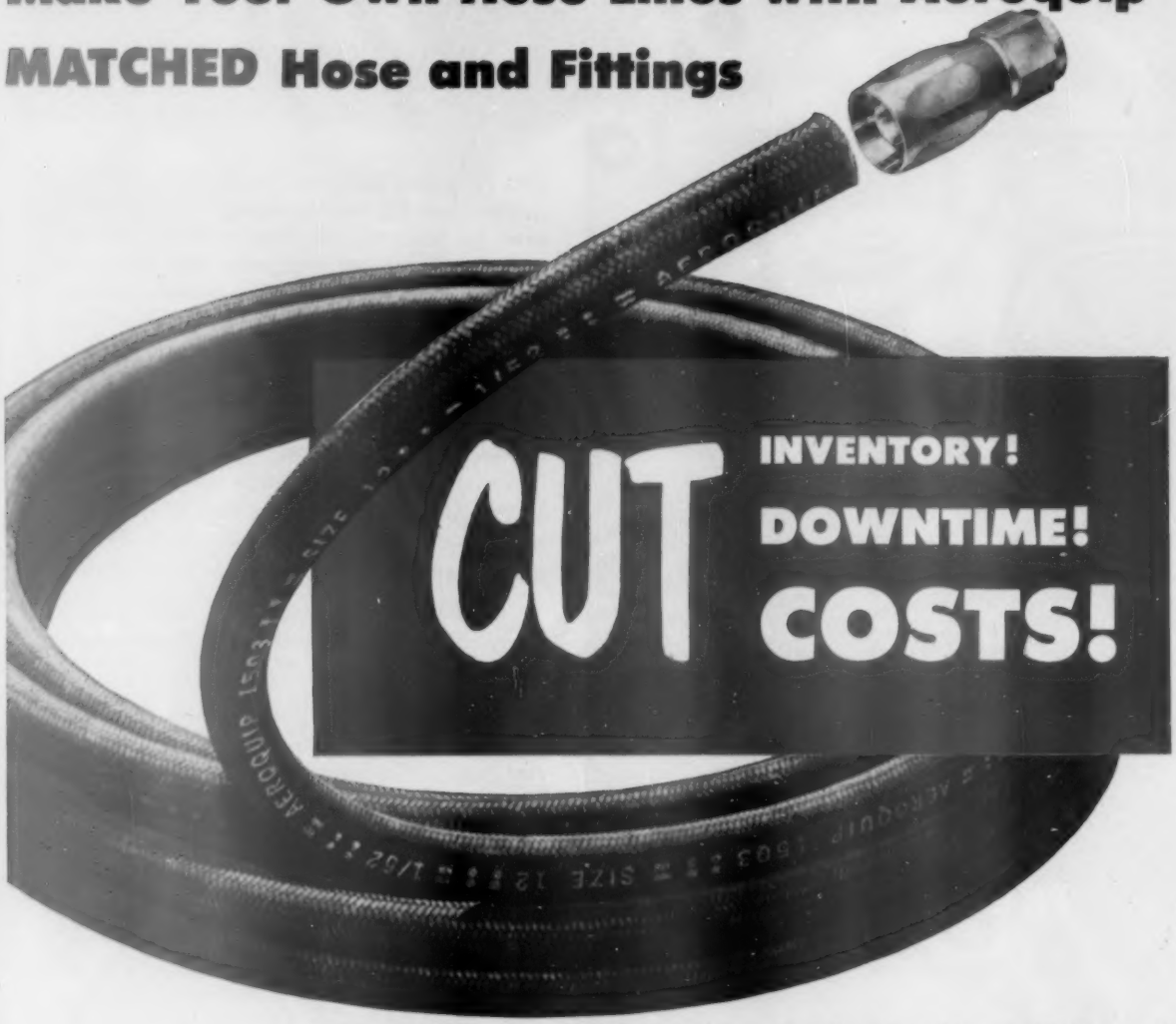
EXPORT

CLEVELAND—C. O. Brandes, Inc.

CANADA

CALGARY—Mutual Supplies, Ltd.
EDMONTON—Alberta Wheel Distributors, Ltd.
MONTREAL—Auto Wheels & Supplies, Ltd.
TORONTO—Wheel & Rim Co. of Canada, Ltd.
VANCOUVER—Wheels & Equipment, Ltd.
WINNIPEG—Ft. Garry Tire Service Ltd.

Make Your Own Hose Lines with Aeroquip MATCHED Hose and Fittings



Aeroquip Fittings are designed, developed, and produced to go with Aeroquip Hose. They form such a foolproof combination that Aeroquip *guarantees* performance. Thus, the hose lines made right in your own plant always measure up to Aeroquip's exacting standards of quality, the highest in the industry. A small supply of Aeroquip Bulk Hose and Fittings assures you of quick hose line replacements at all times . . . and Aeroquip Fittings are detachable and may be used again and again when making new hose assemblies.

Aeroquip

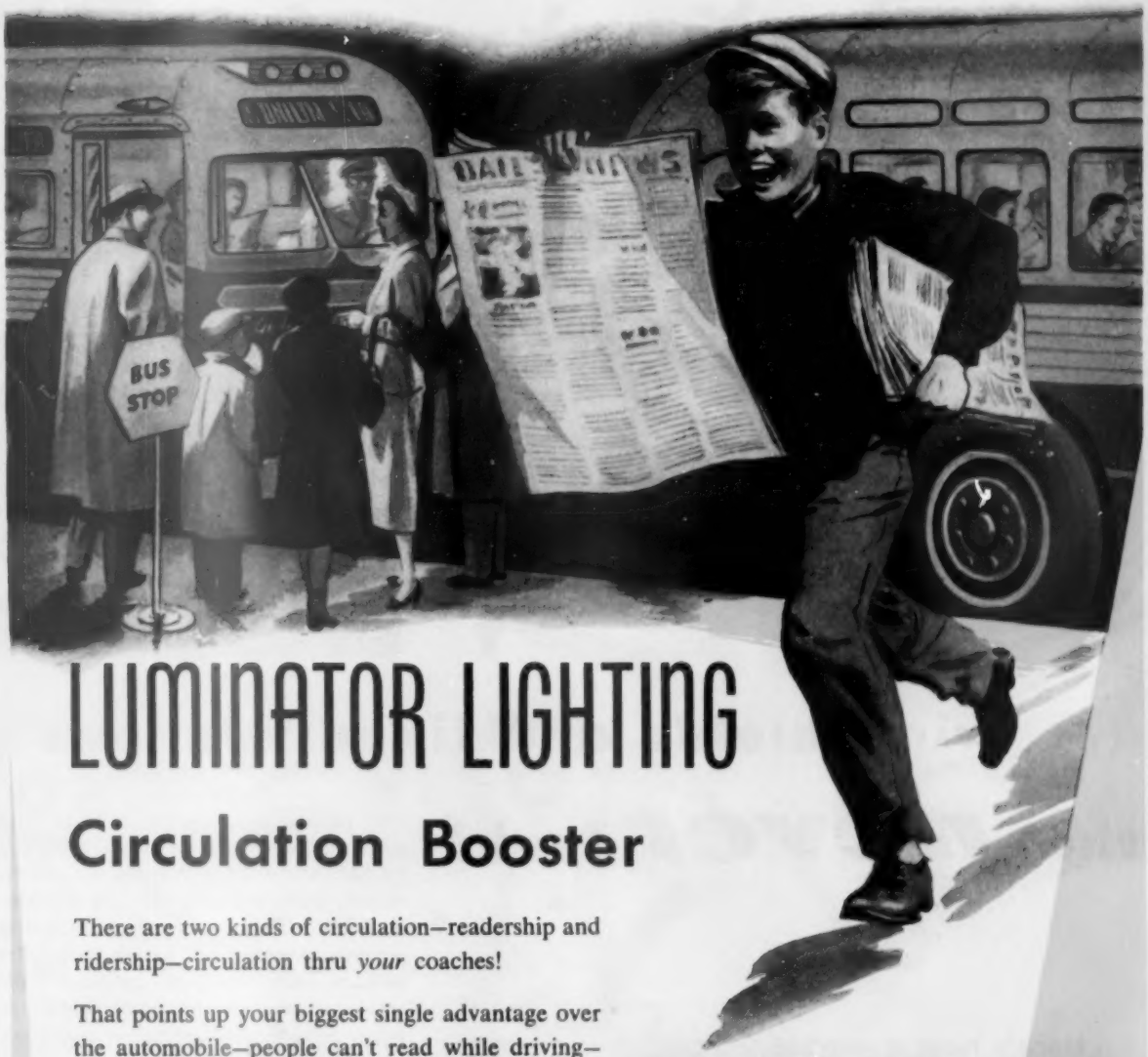
REG. TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: Burbank, Calif. • Dayton, Ohio • Hagerstown, Md. • High Point, N. C. • Miami Springs, Fla. • Minneapolis, Minn. • Portland, Ore. • Wichita, Kan.

IN CANADA: Pranco Progress and Engineering Corporation Ltd., Toronto
IN ENGLAND: Super Oil Seals & Gaskets, Ltd., Birmingham

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD



LUMINATOR LIGHTING

Circulation Booster

There are two kinds of circulation—readership and ridership—circulation thru *your* coaches!

That points up your biggest single advantage over the automobile—people can't read while driving—but they *can* read in *comfort* on Luminator lighted vehicles.

Luminator Fluorescent Lighting highlights the interior of your buses. Makes them safer and more inviting—throws a welcome mat of light at every bus stop. Luminator-designed prisms and lenses reduce glare with increased foot candles—provide lighting that acts as a silent salesman saying, "come aboard and read and relax as you ride!"

LIGHTING ENGINEERS · DESIGNERS · MANUFACTURERS

LUMINATOR inc.

120 NORTH PEORIA ST., CHICAGO 80, ILLINOIS
IN CANADA: RAILWAY AND POWER ENGINEERING CORP.

This strange design means...

windshields and fixed windows

that *never* leak!

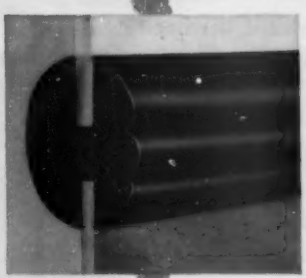
That peculiar image above *might* be anything. Just *look* at all those sharply cut and rounded convolutions! Actually it's a cross-section, greatly enlarged, of Inland Self-Sealing Weather Strip, used on the windshield of a popular passenger car. And the curves, flat surfaces, corners and angles are *precisely* designed, dimensioned and produced . . . *to assure complete and permanent leak-proofing!* No leaks at *all* . . . *ever!*

It's an *unique* Inland idea and product . . . employing the basic principle of resilient rubber, constantly compressed . . . a seal that locks itself for keeps, without cement or binders. See *how*, below!

Inland Self-Sealing Weather Strip is *best* for the vehicle manufacturer . . . using less material, permitting fast, one-man installation that cuts production cost. And *best* for the vehicle user too . . . for much *safer* driving long-lived, trouble-free service, much lower cost when replacing broken glass!

Here's how it works!

One of the simplest forms of Inland Self-Sealing Weather Strip is shown here. The Strip goes into the body panel or other opening. Then the glass goes into the Strip. Then the over-size filler strip goes into the locking channel, expanding it, compressing the whole Inland Self-Sealing Weather Strip into a complete and permanent leak-proof seal!



INLAND MANUFACTURING DIVISION
General Motors Corporation • Dayton, Ohio

INLAND MANUFACTURING

Self-Sealing WEATHER STRIP

Opportunity for PROFITABLE OPERATION

MODEL 332
(32-PASSENGER)

For profitable operation on lines where traffic requires a smaller size bus, use the 32-passenger Transit Bus, Model 332. Important among the many money-making characteristics of Transit Buses are: (1) exceptionally low capital cost, (2) very low operating cost, (3) easy and inexpensive maintenance.
Ask for Specification Brochure 328.

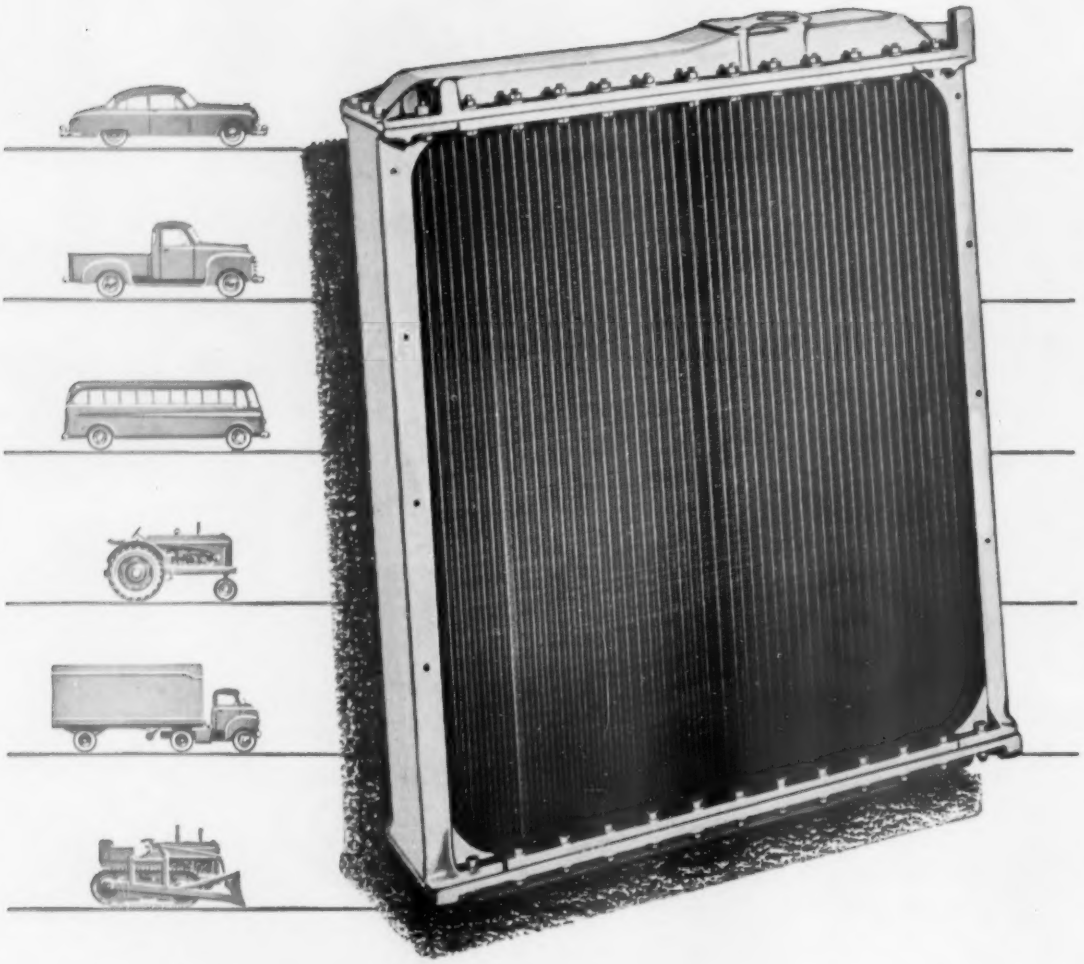
Transit Buses, Inc.

Subsidiary of
CHECKER CAB MANUFACTURING CORP.

Factory
KALAMAZOO, MICH.
•
Sales Offices
SCHAEFER RD. at ELMIRA
DETROIT 27, MICH.

6738

Transit CCM *Buses, Inc.*



Protect Fine Engine Performance With . . .

"balanced cooling"

Too little or too much heat prevent an engine from giving peak performance. "Balanced cooling" protects and prolongs fine performance. For over 50 years, as specialists in radiator manufacture, we have been providing efficient "balanced cooling" systems for car, truck, bus, tractor, stationary and diesel engines. This lifetime of experience assures you unparalleled engineering design and production skill, and the widest range of radiator sizes and capacities.

LONG MANUFACTURING DIVISION, BORG-WARNER CORP. • DETROIT, MICH. and WINDSOR, ONT.

LONG

CLUTCHES • RADIATORS • TORQUE CONVERTERS
OIL COOLERS

How to reduce brake block cost-per-mile

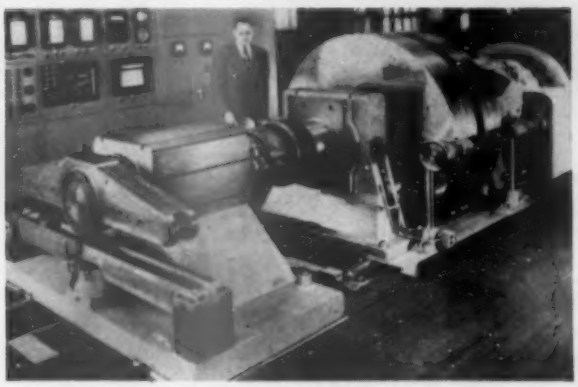
Ask yourself these questions — you may profit from the answers

"Can I lower my labor cost on relines?"

Yes, by using the right combination of long-lasting trouble-free Raybestos blocks. It takes no more labor to install them than it does to install ordinary or inferior blocks, and the savings you get by having fewer relines are tremendous.

"Can I cut down on the number of brake adjustments?"

With the right combination of brake blocks, yes. Proving Ground Tested blocks like Raybestos reduce adjustments to a minimum, give you more time on the road, enable you to make faster schedules, and cut down the labor cost of adjustments.



"Do Raybestos blocks offer me any other advantages?"

Yes, exhaustive dynamometer and Proving Ground Tests prove that Raybestos Blocks will also reduce the costs involved in downtime and pull-ins, the costs caused by drum damage, and the extra check-up costs caused by non-uniform performance.

"Can I cut costs with any other Raybestos products?"

Yes, your costs can be still further reduced by using Raybestos Ray-Lok and Ray-Metl Clutch Facings. And, if you have light and medium vehicles in your fleet, by using Raybestos PGT Truck Sets or Raybestos Lined Brake Shoes—either riveted or bonded.

To learn more about the savings Raybestos can give you, ask your Jobber Salesman about the unique Raybestos Fleet Engineering Plan

Raybestos®

GET IT FROM YOUR JOBBER

AMERICA'S BIGGEST SELLING BRAKE LINING

RM

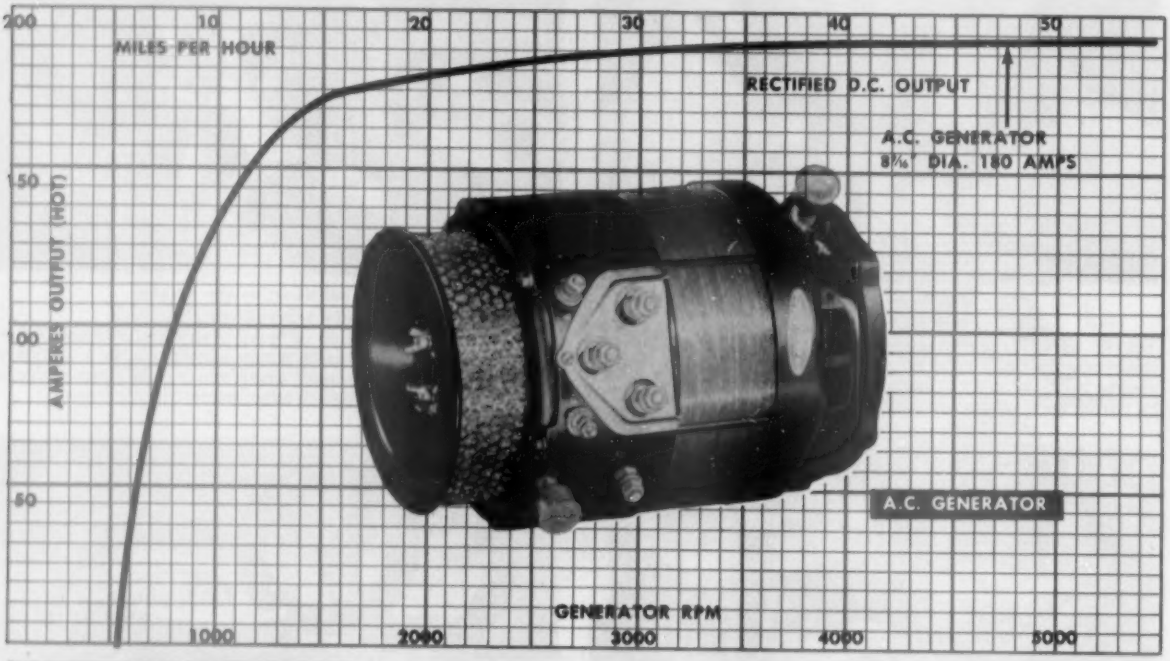
RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

RAYBESTOS-MANHATTAN, INC., Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Industrial Rubber, Engineered Plastic, and Sintered Metal Products • Rubber Covered Equipment • Asbestos Textiles • Packings • Abrasive and Diamond Wheels • Bowling Balls

Power Packed and

DELCO-REMY A. C. GENERATOR

Heavy-Duty 180-Ampere Output Capacity



Rectifier

Regulator

The Delco-Remy A.C. generator is the heart of a 12-volt A.C.-D.C. electrical system designed specifically for modern buses with fluorescent lighting and extra-heavy electrical loads.

Desirable performance characteristics include cut-in at approximately 550 generator rpm . . . maximum output of 180 amperes at approximately 2000 rpm. The new generator supplies not only alternating current for fluorescent lights but also ample direct current for the heaviest electrical loads coupled with lengthy engine-at-idle periods.

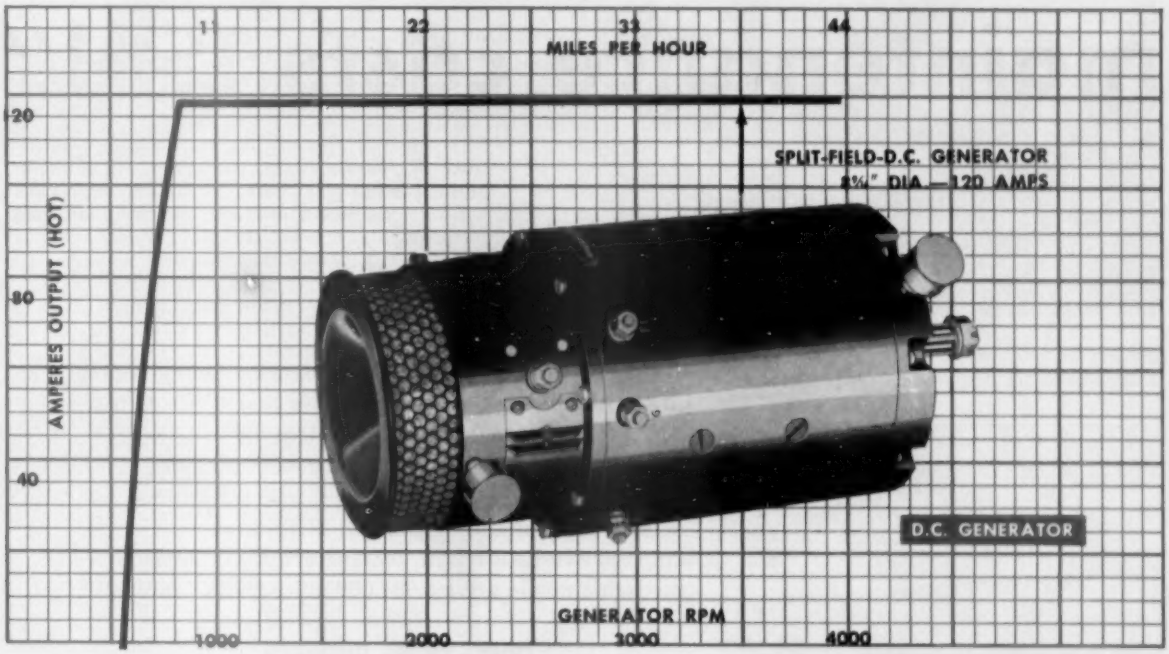
Impressive features of the new generator are its light weight, its very high output capacity, and its ability to operate over a wide speed range with greatest efficiency. Specify Delco-Remy electrical equipment on your new buses.

WHEREVER WHEELS TURN OR PROPELLERS SPIN

Right for the Job

DELCO-REMY D. C. SPLIT-FIELD GENERATOR

Heavy-Duty 120-Ampere Output Capacity



The Delco-Remy 12-volt split-field generator and its companion regulator are rugged and dependable—designed to meet the needs of transit buses having increased electrical loads coupled with a high percentage of engine idling time.

Desirable performance characteristics include low cut-in, high output at engine idle, and quick attainment of maximum output. Cut-in occurs at approximately 550 generator rpm . . . output reaches 70 amperes at approximately 700 rpm . . . maximum controlled output of 120 amperes above 850 rpm.

Operating benefits include reduced battery cycling, long battery life, and a simplified electrical system with sustained voltage — at no sacrifice in ruggedness or dependability. Specify Delco-Remy electrical equipment on your new buses.

Regulator

Delco-Remy

DIVISION, GENERAL MOTORS CORPORATION, ANDERSON, INDIANA

WHEREVER WHEELS TURN OR PROPELLERS SPIN

"Gulflube Motor Oil H.D. reduced our maintenance costs 15%!"

Jack A. Murdie (right) superintendent of equipment, Central New York Coach Lines, shows his maintenance record to A. W. Meister, Gulf sales engineer. Mr. Murdie says that Gulflube Motor Oil H.D. has reduced maintenance costs 15%.

STILL another fine report on the excellent performance of Gulflube Motor Oil H.D.! This time it's from Mr. Jack A. Murdie, superintendent of equipment, Central New York Coach Lines, Inc. at Utica, New York.

This line operates 27 Diesel units and 8 gas units. All coaches use Gulflube Motor Oil H.D. Engines have a complete overhaul on an average of 300,000 miles and one engine was in service 384,000 miles before overhaul!

Improve oil mileage!

We think it would be wise for you, too, to use this outstanding motor oil and improve mileage and reduce maintenance costs on your equipment.

Gulflube Motor Oil H.D. is a superior heavy-duty type oil that not only provides the best possible lubrication, but keeps engines clean. It has a rich paraffin base that provides a strong oil film—excellent for city bus service.

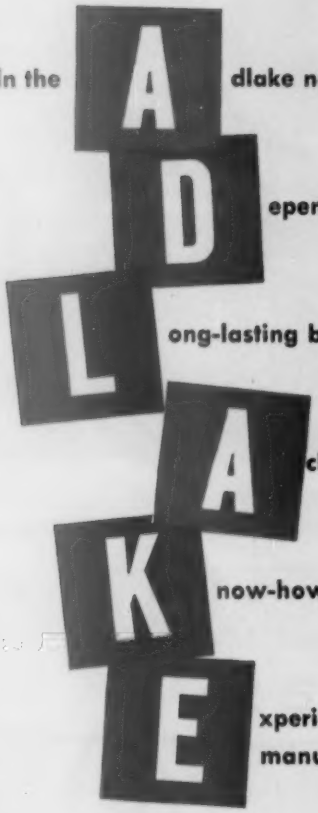
Get all the facts on Gulflube Motor Oil H.D. by contacting your nearest Gulf Office today. A Gulf sales engineer will be glad to call on you and explain how you can get improved mileage, reduced maintenance costs, and higher fleet availability.

Gulf Oil Corporation
Gulf Refining Company

GULF

UTICA
25

What's in a Name?



In the **A**dlake name, there is

Dependability that never fails...

Long-lasting beauty of design...an

Acknowledged reputation for craftsmanship...the

Know-how of an unequalled staff of specialists...and the

Experience gained from almost a century of manufacturing for the transportation industry.

THE

Adams & Westlake

COMPANY

Established 1857 • ELKHART, INDIANA
Chicago • New York

Yes, the ADLAKE name is a pledge of quality...and The Adams & Westlake Company has always kept faith with its customers. No effort is spared to make sure that every customer gets precisely what he bargained for...that he is completely satisfied.

Manufacturers of ADLAKE Specialties and Equipment for the Transportation Industry.

Adlake 97th year of serving the transportation and building industries

WADELL PRESENTS

THE "TRANSFERMATIC"

A BRAKE DRUM LATHE FOR HEAVY VEHICLES ONLY

The Wadell "TRANSFERMATIC" Double Spindle Brake Drum Lathe was designed specifically for buses, heavy duty trucks and trailers. Drums are bored on one spindle and mating linings are turned on the other by means of the exclusive "TRANSFERMATIC" method. Now available to you is a machine entirely new in design based on the "TRANSFERMATIC" method. This machine is massive, and its rugged ness assures you of a clean, true cut regardless of heat checks or hard spots.

ADVANTAGES:

1. Stock only one oversize brake lining.
2. 100% contact of lining to the drum.
3. Brake drums last longer.
4. Freedom from squeal and noise.

Let us send you more detailed information about the Wadell TRANSFERMATIC Double Spindle Brake Drum Lathe. Fill out the coupon below and mail today.

DESIRABLE TERRITORIES AVAILABLE

for Greater Safety and Economy through Greater Precision Look to

WE

WADELL

EQUIPMENT CO.

119 SOUTH AVENUE

GARWOOD, N. J.

WADELL EQUIPMENT COMPANY

119 South Avenue • Garwood, N. J.

Please send me descriptive literature about the Wadell TRANSFERMATIC Brake Drum Lathe.

NAME_____

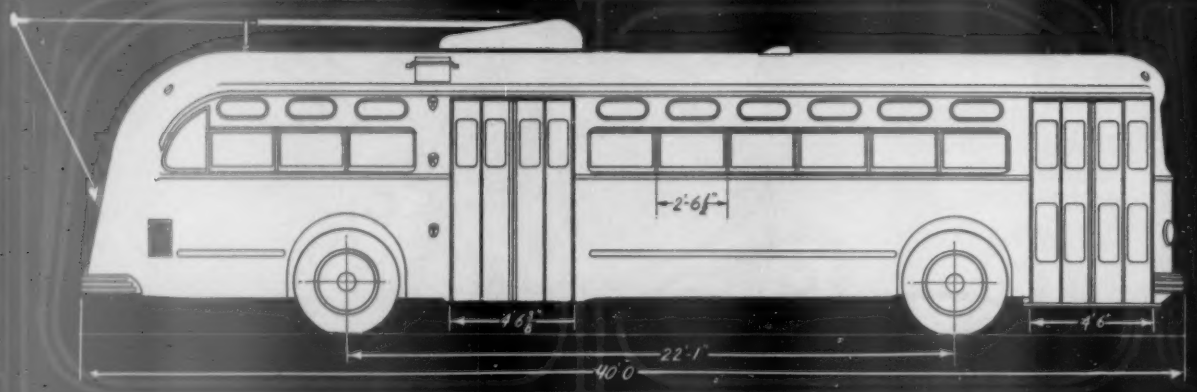
TITLE_____

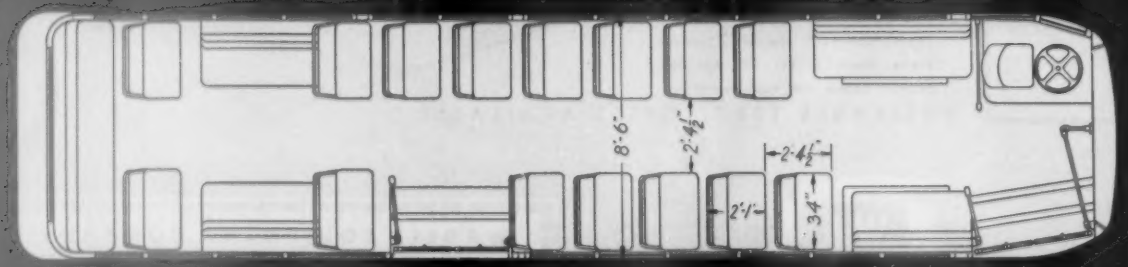
COMPANY_____

CITY_____ ZONE____ STATE____

BT 254

Find out all about this NEW





Standardized Pullman-Standard
Trolley Coach Model 700

"Standardized" Trolley Coach

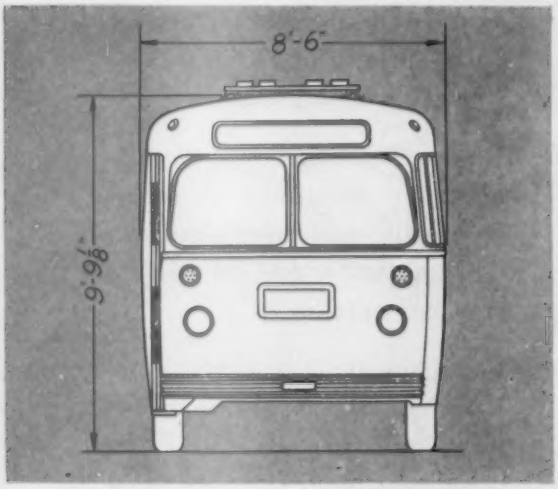
Are you interested in better coaches at lower cost? Then get all of the facts about the P-S model 700 *standardized* Trolley Coach now.

All of the time-and-dollar saving economies and all of the construction advantages of standardized engineering and production are available to you in this sturdy, efficient model. In addition, low operating and maintenance costs are designed-in features.

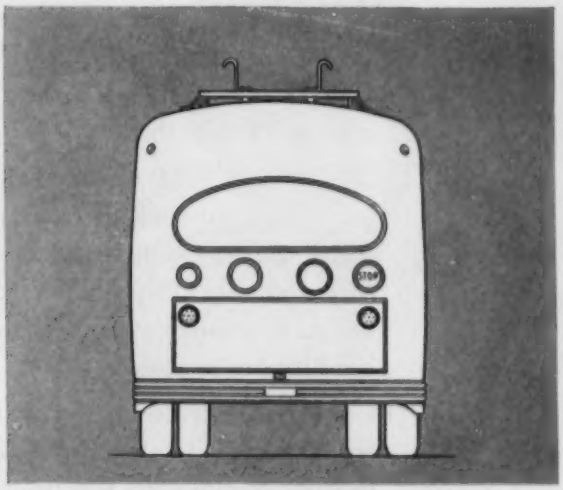
Model 700 is a forty-eight passenger trolley coach with front-entrance and center-exit. It is equipped with a single motor and dynamic braking.

From top to bottom, front to back this model reflects Pullman-Standard's years of experience in building all types of cars and trolley coaches. It shows the results of Pullman-Standard's unsurpassed research, engineering, design and production facilities.

A qualified Pullman-Standard representative will be pleased to discuss Model 700 in detail, with you—just write, or phone the nearest office.



Model 700 is a front-entrance, center-exit, 48-passenger trolley coach. The body has curved sides, sloping ends, arched roof and wooden floor. It is furnished complete in all details ready for operation. Find out about standardized construction with decorative options.



48-Passenger, seating for revenue-building service, also adaptable for 44 to 50 seated passengers, as required. The length over bumpers is 40 feet. Model 700 has a wheelbase of 22 feet, 1 inch. The height, road to top of roof is 9 feet, 10 inches. Auxiliary equipment provides rider comfort, operation economy.

YOUR NEEDS CREATE THE PULLMAN "STANDARD"

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

79 EAST ADAMS STREET, CHICAGO 3, ILLINOIS

BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

SURE STOPS
start with GMC brakes

EVERY time your drivers hit the brake pedal, they must be able to count on a quick, sure response – whether it's the first stop or 200th of the day.

That's why GM Coach brakes are tagged for such special treatment at every stage of manufacture and test. Only the perfectly fit are fit enough when lives and liability are at stake.

GMC brake drums are machined from special metals of incredible toughness–uniquely ventilated to dissipate tremendous friction heats. Linings must be able to stand up under incessant, brutal wear. And the shoe roller mechanism is engineered for consistently smooth braking action – free of "grabbing" dangers.

It's easy to see there's no place for uncertain substitutes in repairs on this life-protecting team. And that's a gamble no GM operator *ever* has to take.

For your nearby GMC Parts Warehouse keeps *genuine* GMC parts within quick and easy reach. And *guaranteed* GMC quality keeps your GM Coaches the smoothest–and safest–on the road today.

GMC Truck & Coach Division of General Motors

GM
GENERAL MOTORS

—best part of any service job

Be careful—drive safely

WEAVER WHEEL DOLLY

lifting capacity of 2500 lbs. more than adequate for handling large duals

Provide your mechanic with the strength of Hercules. The Weaver Wheel Dolly enables one man to lift, lower, remove, replace, and transport the heaviest dual wheels and tires. It takes the time-consuming drudgery out of brake, tire, and wheel bearing work . . . saves manpower . . . prevents personal injury.

The Model WR-31 Dolly shown is equipped with roller type lifting arms powered by a hydraulic jack. These arms may be easily maneuvered under upright wheel on floor . . . quickly raise it to spindle height. Wheel can then be easily rotated until bolt holes meet or keys meet keyways. Jack also simplifies lowering of load in wheel removal.

The Model WR-31 rolls smoothly on ball-bearing swivel casters and is easily maneuvered. Chain and adjustable crossbar hold wheel securely in place.

See your Weaver jobber for full information and prices on all three sturdy Weaver Wheel Dolly models or write us for Bulletin BT-602. You'll find they quickly pay for themselves in *time saving* alone!

WEAVER

WEAVER MANUFACTURING CO., SPRINGFIELD, ILL., U. S. A.

SERVICE SHOP EQUIPMENT

Complete Weaver line includes: Twin Post Lifts . . . Unit Lifts . . . Car Washers . . . Safety Lanes . . . Wheel Alignment Equipment . . . Headlight Testers . . . Brake Testers . . . Wheel Balancing Equipment . . . Jacks . . . Wheel Dollys . . . and Air Compressors.

CONTINENTAL RED SEAL

TRANSPORTATION GASOLINE ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Bare Engine H.P.
N4062	4	2⅛	3½	62	25 @ 3400 RPM
Y4069	4	2½	3½	69	28 @ 3400 RPM
Y4091	4	2⅝	3½	91	36 @ 3400 RPM
F4124	4	3	4½	124	47 @ 3200 RPM
F4140	4	3⅛	4½	140	52 @ 3200 RPM
F4162	4	3⅜	4½	162	58 @ 3200 RPM
F6186	6	3	4½	186	77 @ 3500 RPM
F6209	6	3⅛	4½	209	90 @ 3500 RPM
F6226	6	3⅛	4½	226	99 @ 3500 RPM
M6271	6	3½	4½	271	97 @ 3000 RPM
M6290	6	3⅝	4½	290	108 @ 3000 RPM
M6330	6	4	4½	330	125 @ 3000 RPM
K6271	6	3½	4½	271	115 @ 3200 RPM
K6290	6	3⅝	4½	290	123 @ 3200 RPM
K6330	6	4	4½	330	145 @ 3200 RPM
B6371	6	4⅛	4½	371	124 @ 3000 RPM
B6427	6	4⅛	4½	427	142 @ 3000 RPM
T6371	6	4⅛	4½	371	144 @ 3000 RPM
T6427	6	4⅛	4½	427	170 @ 3000 RPM
U6501	6	4½	5½	501	178 @ 2600 RPM
R6513	6	4½	5½	513	180 @ 2800 RPM
R6572	6	4⅝	5½	572	200 @ 2800 RPM
R6602	6	4⅞	5½	602	212 @ 2800 RPM
S6749	6	5⅛	5½	749	250 @ 2800 RPM
S6820	6	5⅜	5½	820	275 @ 2800 RPM

TRANSPORTATION DIESEL ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Bare Engine H.P.
TD6427	6	4⅛	4⅝	427	116 @ 2400 RPM
RD6572	6	4⅛	5½	572	162 @ 2400 RPM
SD6802	6	5⅛	5½	802	217 @ 2200 RPM

. . . AT LOWER TON-MILE COST

When you buy a vehicle powered by Continental Red Seal engine, you "plug in on" specialized knowledge that goes back a long, long time . . . benefit from engineering features, and advances in production technique, evolved over a period of more than 50 years. Red Seal dependability, economy and stamina have long been building prestige for the industry's quality leaders. Continental-powered transport units will give you more and better power—at lower ton-mile cost.

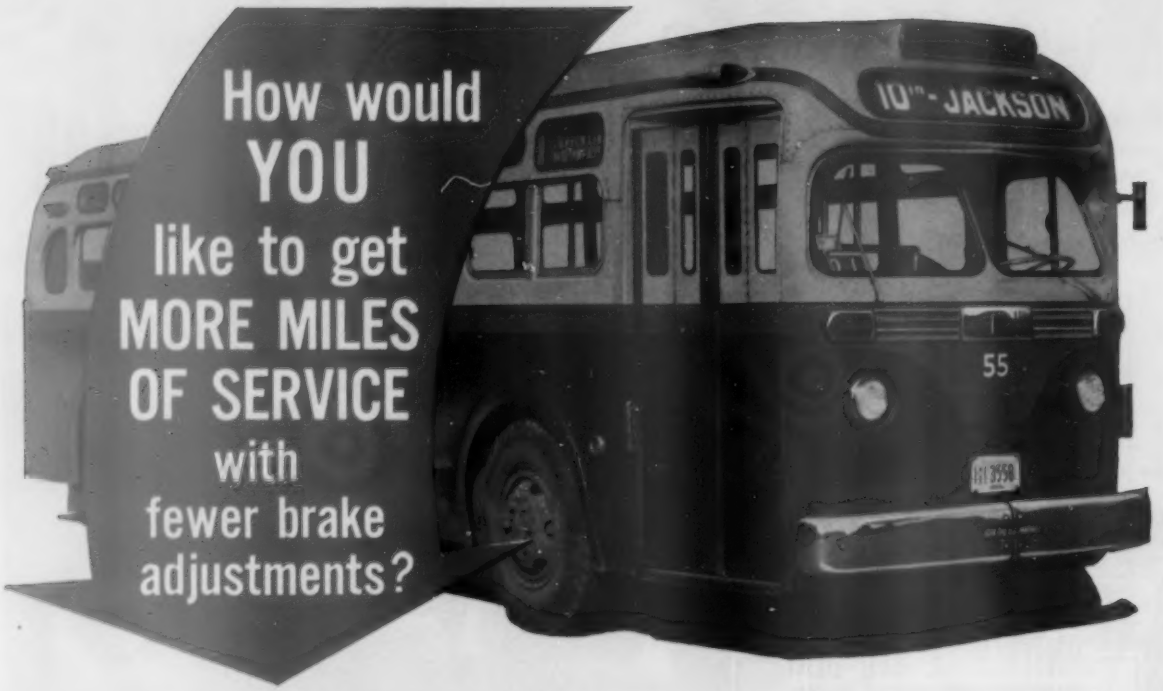
PARTS AND SERVICE EVERYWHERE

1819 BROADWAY, NEW YORK 23, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
8218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

Continental Motors Corporation

MUSKEGON, MICHIGAN

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD



reline with

WAGNER® BRAKE LINING

Wagner Brake Lining retains the same uniform blend of frictional materials through its long operating life. It will not injure drums . . . will never compress, absorb moisture or deteriorate with age. This assures perfect engagement with drum, and smooth, jerk-free stops over an extra-long service life. Brake adjustments are reduced to a minimum. This means less "down time," fewer drum replacements, more mileage from lining, less fatigue for drivers, smoother riding for "standees," closer adherence to schedules, MORE SAFETY FOR EVERYONE! . . . SAFE BRAKES save lives!

The uniform excellence of all Wagner Brake Lining is assured by exhaustive testing in the laboratory and at the proving ground. You can depend upon WAGNER QUALITY because Wagner Products are used as original equipment by manufacturers of buses, trucks, trailers, and automobiles.

Available in sets, rolls, blocks, slabs, cut segments. Coverage is complete for every bus, truck, or car. See your Wagner jobber or write us.

Wagner Electric Corporation
6461 Plymouth Ave., St. Louis 14, Mo., U. S. A.
(Branches in principal cities in the U. S. and in Canada)

B54-3

Wagner *...the best known name in brake service*

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • ReRol • CONRAY BRAKE LINING • AIR BRAKES
TACHOGRAPHS • ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL CRANE BRAKES

Let's look at it this way...

Any way you look at it, you know the greatest thing you can do for your passengers is to provide a relaxing, comfortable ride. Whether your passengers board your vehicles at the end of a work day or shopping tour, or for a city to city trip—they'll love every minute of the ride—on National seats. *National seats are created by men who have set the standard for fine seating in the transportation industry for over 20 years.*

National
SEATING COMPANY

George B. Cross Company **EXCLUSIVE SALES AGENTS**

Factory and Offices: 167 Park Avenue, East, Mansfield, Ohio
General Sales Office: 624 So. Michigan Avenue, Chicago 5, Ill
Eastern Sales Office: 1775 Broadway, New York 19, New York

exceeds
SAE SPECIFICATIONS

Use Delco Super 11 heavy-duty brake fluid for the TOUGH braking jobs!

Delco Super 11 heavy-duty brake fluid exceeds SAE specification 70R1 which establishes performance standards for heavy-duty brake fluid, including operating temperature ranges, stability, lubrication, effect on metals and rubber — to name a few—and also exceeds U.S. Federal specification VV-F-451a.

Delco Super 11 is packaged in any amount convenient for you, from 16-ounce to 54-gallon containers. Place your order with your United Motors distributor today.

A GENERAL MOTORS PRODUCT — A UNITED MOTORS LINE

DISTRIBUTED BY WHOLESALERS EVERYWHERE

moraine products

DIVISION OF GENERAL MOTORS CORPORATION, DAYTON, OHIO

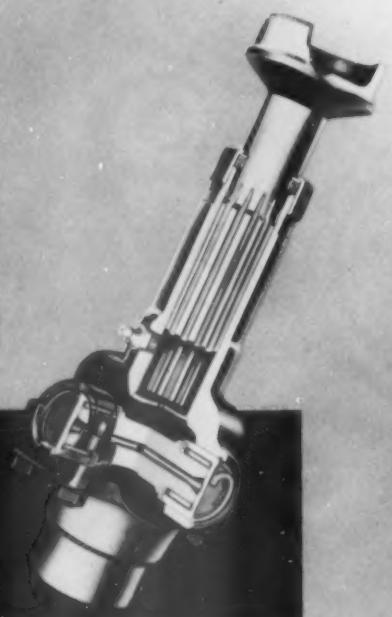
Spicer has grown up with "the family"

The Spicer organization and the automotive industry were boys in knee pants together. They played in the same yard . . . went to the same school . . . faced the same problems of life together. Spicer has grown up with the automotive industry in every phase of its development.

Spicer products have been an integral part of most American automobiles since 1904. The designing and manufacturing skill gained from producing millions and millions of Spicer units is used by a majority of the manufacturers in the passenger car, truck, bus and tractor fields.

THIS IS SPICER IN POTTSTOWN, PENNSYLVANIA

Facilities of the Pottstown plant are devoted to the high production requirements of Spicer Universal Joints and Propeller Shafts in the smaller sizes, for use in passenger cars, light and medium size trucks, and industrial applications



The unique and original design of Spicer Universal Joints has made them the *Standard of the Industry*

Sliding splines have ground finish on ALL contact surfaces, and have extra hardness and iron manganese phosphate coating.

True bearing alignment with rigid one-piece yoke design. This rigidity is the essence of accuracy.

Precision bearings with improved surface hardness and finish.

Dynamically balanced to minimize vibration.

Uniform high quality propeller shaft tubing. Steel made to our exacting specifications.

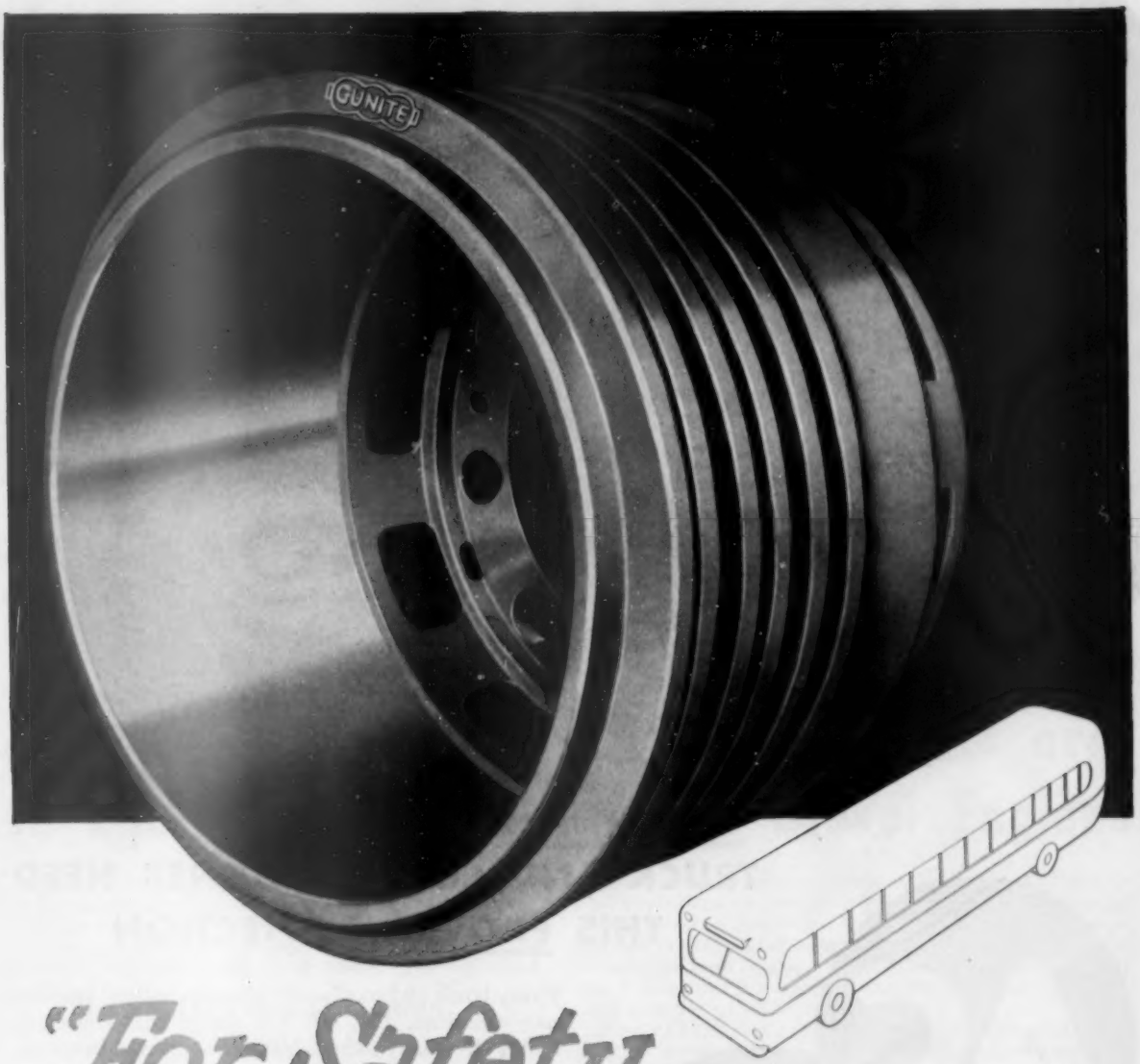
Wide selection of flange and yoke types and sizes to suit each individual requirement.

SPICER MANUFACTURING DIVISION of Dana Corporation • Toledo 1, Ohio

50 YEARS OF Spicer SERVICE

ENGINEERING **DANA** MANUFACTURING

TRANSMISSIONS • UNIVERSAL JOINTS • PROPELLER SHAFTS • BROWN-LIPE and AUBURN CLUTCHES • FORGINGS • AXLES • STAMPINGS • SPICER BROWN-LIPE GEAR BOXES • PARISH FRAMES • TORQUE CONVERTERS • POWER TAKE-OFFS • POWER TAKE-OFF JOINTS • RAIL CAR DRIVES • RAILWAY GENERATOR DRIVES • AIRCRAFT GEARS • WELDED TUBING



"For Safety... insist on GUNITE DRUMS!"

Your passengers, your drivers and your equipment are assured the utmost safety by combining Gunite Brake Drums with safe driving practices. You get more miles of smooth, silent, safe stops with Gunite Drums.

Extra strength of Gunite-Metal . . . Extra strength of Gunite Heavy-Ribbed Design assure you of greater brake-safety. Just as there is no substitute for safe-driving-practice . . . there is no substitute for Gunite Brake Drums.

write for information

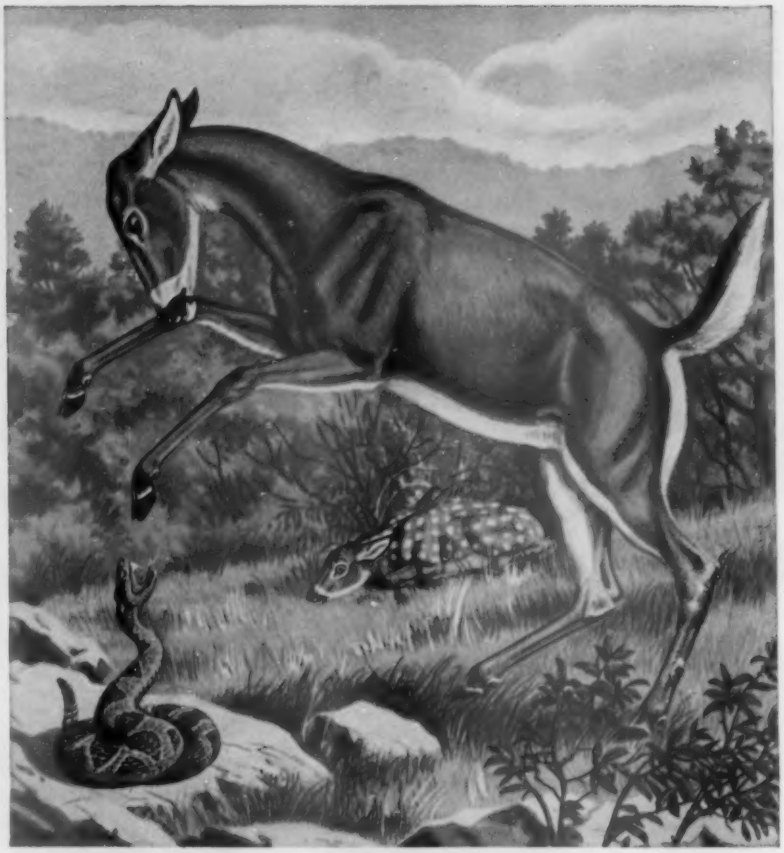
GUNITE

See Your Gunite Distributor

GUNITE FOUNDRIES CORPORATION · Rockford, Illinois

Animals Protect Themselves

Normally of a very timid nature, a Doe will fight ferociously and effectively to protect its Fawn against attacks of Rattlesnakes and other natural enemies.



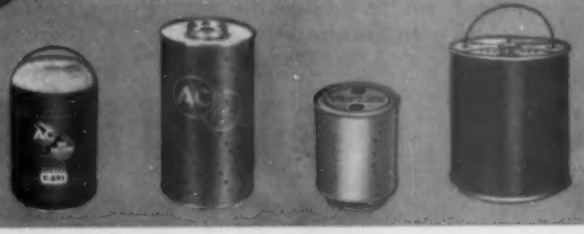
TRUCK AND COACH ENGINES NEED THIS PROVED PROTECTION

AC OIL FILTER ELEMENTS

Every truck and coach engine has its natural enemies too—the dust, dirt, grit and sludge that collect in motor oil—ready to attack smooth-surfaced bearings, pistons and other expensive precision parts.

AC Oil Filter Elements provide proved protection against these engine oil enemies. When you standardize on AC Elements for your replacement needs, you *know* that these better elements will take care of an important problem. There's an AC Oil Filter Element engineered to give you top service no matter what makes of engines you have in your fleet.

A BETTER ELEMENT FOR EVERY MAKE OF FILTER



AC SPARK PLUG DIVISION GENERAL MOTORS CORPORATION

37-PASSENGER CITYLINER—WITH TWO DOORS. ONE OF THE FITZJOHN FAMILY OF REAR-POWERED COACHES—GASOLINE OR DIESEL 27 TO 41 SEATING CAPACITY—ONE OR TWO DOORS

NOW! FITZJOHN CITYLINERS are also Equipped with CUMMINS Diesel Engines!

If you prefer a diesel-powered CITYLINER instead of gasoline driven, you can have it! And if you want what one big user claims to be *"the most efficient and economical diesel power plant ever developed for bus use,"* you can have that in a CUMMINS Diesel Engine. Both power (150 h.p.) and economy are yours in our Cummins, known as the JBS 600. This engine delivers full-rated power for faster acceleration—with plenty in reserve for tough spots. It has an exclusive fuel and injection system and other features that are factors in *lower fuel costs!* Not only can it operate on the inexpensive No. 2 diesel oil but operators report—and can PROVE—*more miles per gallon!*

But CITYLINERS are also economical otherwise! Their original investment cost is low and their maintenance costs are low. That's why so many bus operators are sending in so many REPEAT orders. (*The Best Sign of Satisfaction is a Repeat Order.*)

The CITYLINER'S *Economical* (Diesel) POWER PLANT

150 h.p.—JBS 600 CUMMINS Diesel

In DEED, there's nothing finer than a CITYLINER!

A diesel-powered CITYLINER demonstrator will show its smooth operation and prove its economy. This coach may be—or can be—coming your way. Ask for a demonstration over any of your routes.

Send for Specifications showing seating charts, pictures that portray "passenger-appeal" and facts about the CITYLINERS—the money-saving and money-making coaches. Or ask for names of operators nearest you!

Builders of Fine Motor Coaches for More Than Thirty Years!

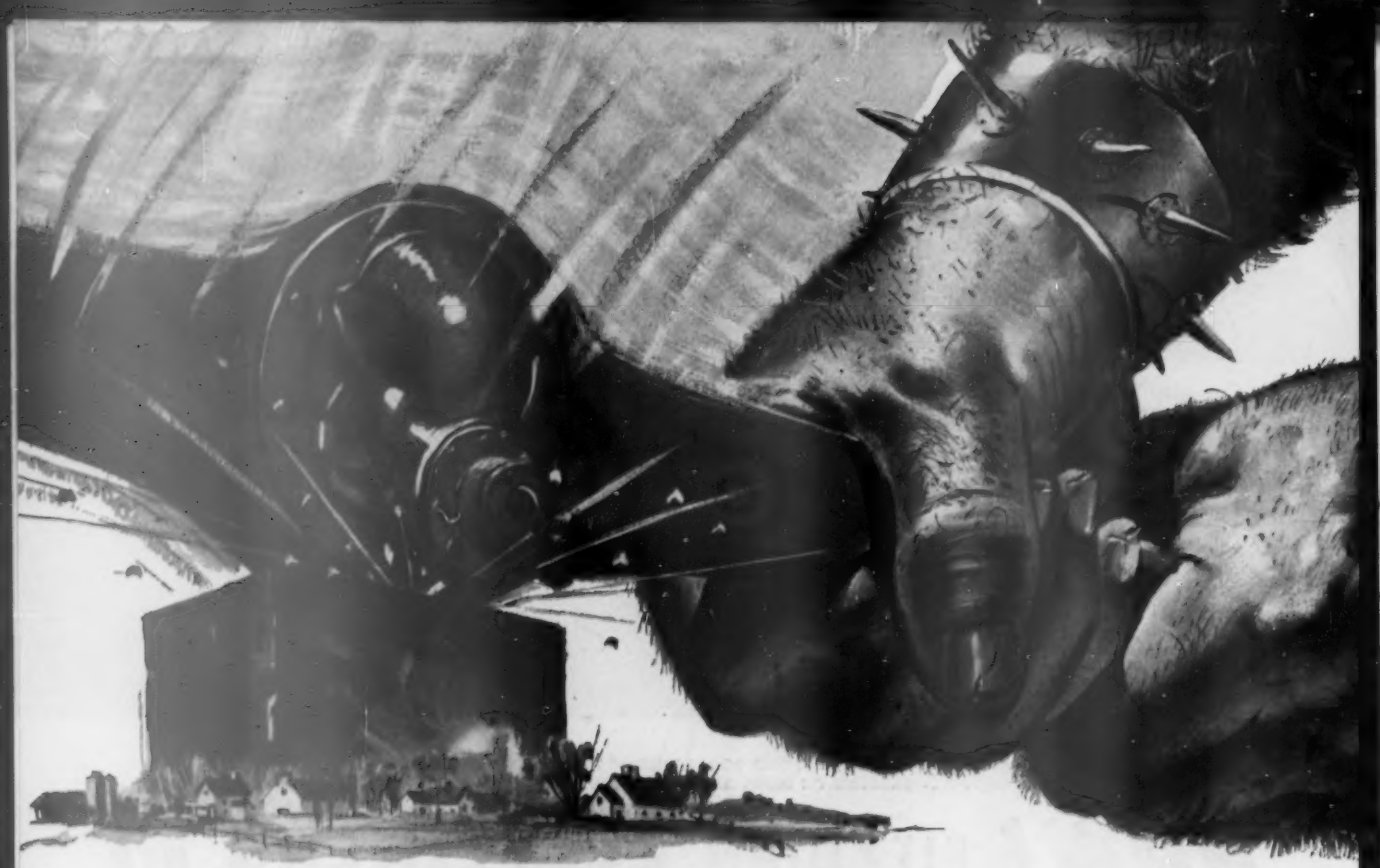
FITZJOHN COACH COMPANY
MUSKEGON, MICHIGAN

IN MEXICO
Distribuidora de Omnibus Fitzjohn, S. A.
Ave. Morelos No. 83
Mexico City, Mexico

IN CUBA
Distribuidora de Omnibus Fitzjohn de Cuba, S. A.
E. No. 310, esq. Calle 15
Vedado, Havana, Cuba

CANADIAN COMPANY—FITZJOHN COACH OF CANADA, LTD., Brantford, Ont.

"If it's made by Fitzjohn, it's made to make you money!"



We give bus axles a brutal

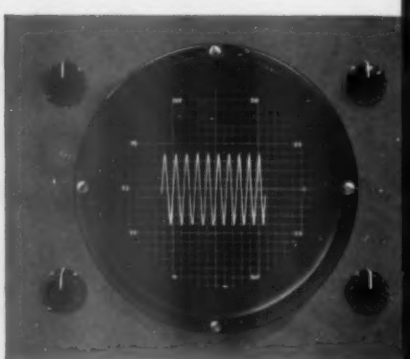
in the new Timken-Detroit indoor proving ground . . . and only

We torture them . . . shock-load, over-speed and jerk them . . . twist, strain and abuse them. We match every on-the-job hauling condition . . . then throw in a few devilish tricks of our own!

The result? You know for sure that *any* Timken-Detroit axle can take more abuse on the job it was built for than any other axle made!

To prove it, we moved a huge proving ground indoors. In one room we can simulate any hauling situation—our engineers can apply 50 years of experience to perfecting axles for modern trucks, buses and trailers, and measure performance with scientific precision.

This research pays off in longer truck life; less maintenance, repairs and downtime; lower operating costs. No wonder Timken-Detroit axles with Hypoid gearing rate "first" with wise truck owners!



Whatever you haul . . . simulated service conditions show up electronically on a screen like this. For instance—a heavily loaded bus on a bumpy, twisting road—then on a level express highway or long grade. What happens to the axle and gearing is measured, charted with absolute scientific accuracy.

TDA proves axle quality and performance in this "Torture Chamber"

Here we simulate actual highway conditions . . . test quality and performance of axles under any hauling situation, such as duplicating the kinetic energy of 80,000 lbs., G.C.W., at 60 m.p.h. All tests are repeated hour after hour with an automatic cycling control.

School buses? You have little lives at stake . . . their comfort, safety and promptness at school. You need axles you know for sure will perform under any condition – and – do it at low maintenance cost, little downtime and long bus life. Your answer – buses equipped with Timken-Detroit "Torture-Tested" axles with Hypoid gearing.

Intercity buses? Let's not fool around! You have weather, roads *and* schedules to consider. You need axles that can handle all three – with comfort and safety to spare. You're operating "close" so you need low cost upkeep, easy handling and little shoptime. You need Timken-Detroit "Torture-Tested" axles with Hypoid gearing.

City and suburban buses? You work on pennies to provide stop-and-go service with peak loads one hour . . . half-empty or long runs in between. Weather or not – you have to be there, on time, safe, comfortable. Costly maintenance or enroute breakdowns are out! You need Timken-Detroit "Torture-Tested" axles with Hypoid gearing.

beating

Timken has it!

TIMKEN *Detroit* **AXLES**

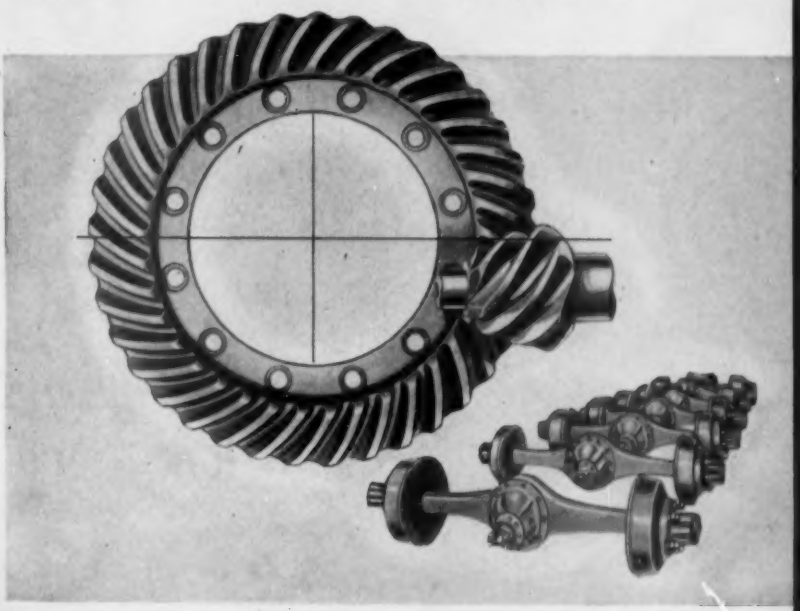
TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted D A CO *Standard*

TRADE MARK REGISTERED

"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS



For low, low maintenance . . . specify Timken-Detroit axles with Hypoid gearing

Hypoid gearing for bus axles was pioneered by Timken-Detroit.

Proved in billions of ton-miles of actual operation. Designed to give the slower gear ratios necessary for modern engines without loss of strength. Pinion is bigger, stronger . . . bearings are larger . . . more teeth in contact reducing loading per unit of contact area. Torque transmitting capacity increased to step up performance and rugged power.

Get interchangeability, too!

Only Timken-Detroit has Hypoid gearing in a complete "family" of 7 basic axle capacities – in the entire range of medium and heavy-duty requirements. This advanced-related design incorporates the same features of construction and interchangeability in single-speed; single-speed double-reduction; and two-speed double-reduction final drive units.

Plants at: Detroit, Michigan
Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

Dependability is measured in long, long miles....

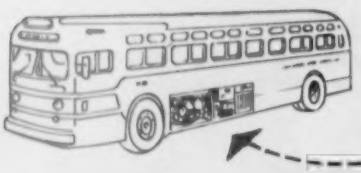
In the motor coach industry, only time and the highway can judge the worth of mobile equipment. That's how Tropic-Aire—Carrier motor coach air conditioning equipment has earned a reputation for lasting dependability . . . through *twenty billion passenger miles of perfect performance annually*. That's a lot of service by *any* measure.

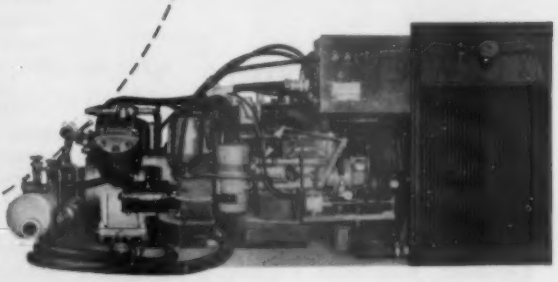
Carrier
TROPIC-AIRE Inc.

5201 W. 65th STREET, CHICAGO 38, ILL.

TROPIC-AIRE, INC., IS A SUBSIDIARY OF McGRAW ELECTRIC CO., CHICAGO

Catalog upon request





LONG LIFE LOW UPKEEP!

That's what you can expect from your engines... when you use Delvac Oils!

Greater efficiency . . . greater fuel and oil economy . . . fewer repairs and overhauls — that's what you can expect from your Diesels and heavy-duty gasoline engines when you change to famous Delvac Oils. Here's why:

Delvac Oils have a service-proved super detergent formula that keeps dirt in suspension . . . drastically reduces deposits . . . protects vital engine parts against corrosion. They also resist oxidation and foaming.

The result — less engine wear, longer engine life . . . greater availability and profit from every unit.

Your Socony-Vacuum representative can supply you with Delvac Oils — recommended or approved by leading engine and equipment builders.

DELVAC OILS

Correct Lubrication for Fleet Operators

Delvac 900 Series Oils: Under API Classification, recommended "For Services MS, DG."

Delvac S-200 Series Oils: Under API Classification, recommended "For Service DS."

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC., MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

again Flxible selects

GOODALL FABRICS

for famous Visicoaches

Goodall Fabrics is proud of its long association with The Flxible Company. Goodall's *Blended-to-Perform* upholstery continues to be standard with Flxible because of its proven ability to give modern transportation maximum serviceability, lasting beauty, and easier maintenance.

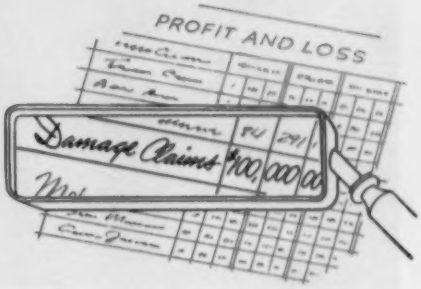
Where Durability and Luxury are the keynote...
GOODALL FABRICS
are preferred

Goodall-fabrics
THE FINEST NAME IN FABRICS

©1953, Goodall Fabrics, Inc., Subsidiary Goodall-Sanford, Inc. (Sole Makers of World-Famous PALM BEACH* Cloth) *Registered Trade Mark

GOODALL FABRICS, INC. NEW YORK • BOSTON • CHICAGO • DETROIT • LOS ANGELES

Control here . . . means Control here!



Some transit operators will find themselves "in the black" at the end of the year through a mere fluke of chance. They've gambled by retaining inefficient door control equipment on their vehicles – and won, temporarily.

Certain other transit operators will find their Annual Reports cheerless reading. They, too, gambled with substandard interchange equipment, and were thrown for a loss by claims costs.

Today's steadily increasing operating costs *demand* that claims costs be kept at the very minimum.

That is why the vast majority of transit operators insist on NP door control and safety equipment for their vehicles. They know that NP equipment insures optimum safety in passenger interchange, helps driver concentration, and saves precious time at each stop.

These factors alone often spell the difference between red ink and black.

BE SURE . . . ALWAYS SPECIFY NP DOOR CONTROL AND SAFETY EQUIPMENT

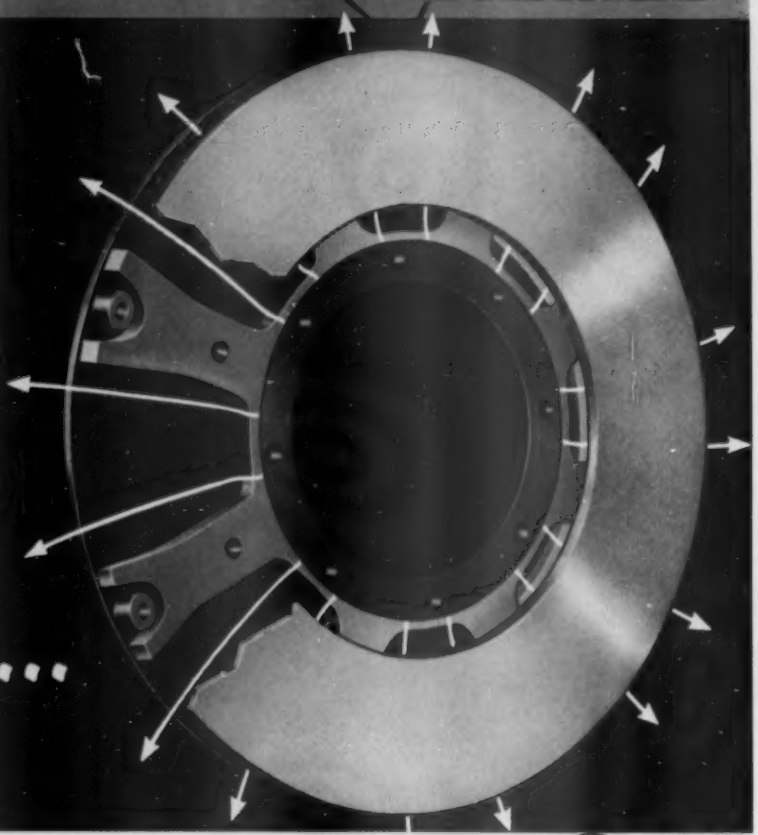
NATIONAL PNEUMATIC CO., INC. AND **HOLTZER-CABOT** DIVISIONS

125 Amory St., Boston 19, Mass.
PHILADELPHIA • CHICAGO • NEW YORK • CLEVELAND
Sales Service Representatives in Principal Cities throughout the Free World

Designers and manufacturers of mechanical, pneumatic, hydraulic, electric and electronic equipment and systems

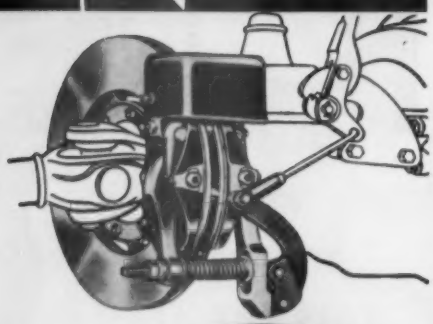
an ACCO product

TRU-STOP *Emergency* BRAKES



the VENTILATED DISC makes the difference...

AIR-COOLED...



TRU-STOP, the ventilated, disc-type brakes, serve in an emergency, as an auxiliary brake on long downgrades, and as a positive parking brake. They are a real safeguard in case of power or hydraulic brake failure. They prevent accidents and eliminate road delays.

You or your dealer can install TRU-STOP Brakes easily on your present equipment : : : or you can have them installed at the factory. It's a good investment in safety. See your dealer or write today for literature and prices:

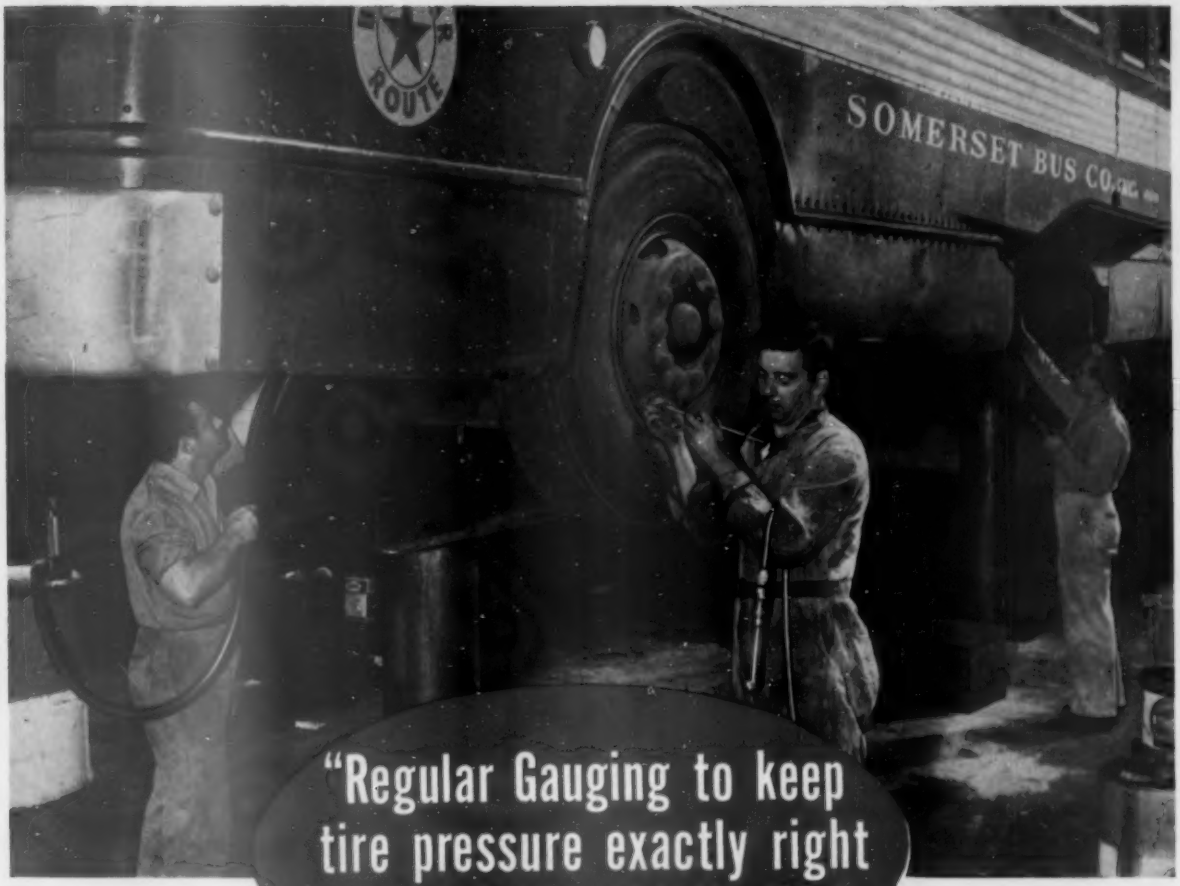
ACCO

TRADE MARK

AUTOMOTIVE AND AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE

601 Stephenson Bldg., Detroit 2 • 2216 So. Garfield Ave., Los Angeles 22 • Bridgeport 2, Conn.

TRU-STOP *Emergency* BRAKES



"Regular Gauging to keep tire pressure exactly right adds plenty to tire life"

This is what Harold Eick, Superintendent of Maintenance, Somerset Bus Company, Inc. Mountainside, N. J., says:

"In addition to a 2000-mile tire check up, we gauge tires on all buses daily with a Schrader 7188BH dual foot service gauge.

"We also check for missing valve caps, worn valves or valve cores. These are replaced with Schrader Products exclusively."

Whether *your* fleet is big or small, your job is to keep it rolling, and to hold down costs. That's why it pays to follow a thorough tire valve maintenance program, and to use finest quality products. *Specify* Schrader when you order Tire Gauges, Tire Valves, Valve Caps and Cores, Valve Tools and all Airline Fittings.

Always certify all your gauging-inflating equipment with the 8106B Trutest Special Gauge, so you're sure all your gauges are right.

7260 Duplex Valve Converting Tool
7823R Truck and Bus Convertible Tire Valve
7188BH All-Purpose Service Gauge
8106B Trutest Special Gauge

Schrader
REG. U. S. PAT. OFF.

FIRST NAME IN TIRE VALVES
FOR ORIGINAL EQUIPMENT AND REPLACEMENT

A. SCHRADER'S SON, *Division of Scovill Manufacturing Company, Incorporated*, 470 Vanderbilt Ave., Brooklyn 38, N. Y.

HOW PARCOA* PUTS PROFIT IN PERIMETER PARKING

* PARCOA

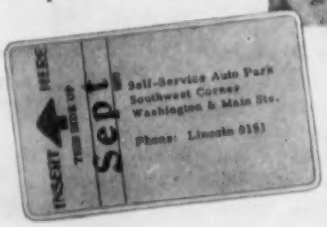
Another "First" in Revenue Collection Equipment Developed by Johnson Fare Box Company

Traffic engineers everywhere are faced with the ever-increasing headache of traffic strangulation and the mounting loss of pay load as more and more riders turn to their own cars for transportation.

Now, Johnson fare collection specialists present the PARCOA Automatic Card-Key Parking System . . . available through the Parking Corporation of America . . . as a practical solution to this twofold problem.

By providing a system which simplifies and facilitates perimeter parking, the PARCOA plan, combined with strategically located parking areas and express shuttle service, offers these direct benefits:

1. Relieves downtown congestion by decreasing car population.
2. Attracts riders you otherwise would not get, and increases revenue.
3. Provides additional revenue from parking operation.
4. Gives automatic parking lot operation without the cost of attendants.
5. Speeds your entire service, thus attracting more riders.
6. Your choice of controls (coin, card, token or any combination) makes this system adaptable to individual requirements.



It will pay you to look into the possibilities of PARCOA for your operation. One of our traffic specialists will be glad to talk it over with you at your convenience. Write, wire or phone today.

The basis of the PARCOA system is a coded card-key which electrically controls entrance and exit gates to your parking area. No attendants are necessary. Only card holders can park. The same card-key can be used for monthly parking and for shuttle bus fares. The system is simple, safe, dependable . . . low in first cost and negligible in maintenance. Write for descriptive bulletin.

A Development by **Johnson Fare Box Company**
Specialists in Revenue Collection since 1909

PARCOA

Marketed through its subsidiary... **Parking Corporation of America**

33 North La Salle Street, Chicago 2, Illinois, Telephone: ANdover 3-4322

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES

Metcalf
100% WOOL
Twist Gabardines
FOR
UNIFORMS
UNIFORM CLOTH
METCALF BROS. & CO., INC.
WHEN BUYING A UNIFORM ... LOOK FOR THE TRADE-MARK ON THE BACK OF THE FABRIC. IT IS YOUR GUARANTEE OF UNIFORMITY IN COLOR AND SERVICE.
Woven by Metcalf...
for Over 85 Years,
Leaders in Fine All Wool Fabrics
Metcalf-controlled from yarn to finished fabric for quality, good looks, durability, warmth. Woven with a hard finish that resists friction at all points of wear, retains its smart appearance. In 12 oz., 14 oz., 16 oz., weights. Colors: Blue Mixture, Brown Mixture, Green Mixture, Oxford. Good fabrics for good uniforms.
METCALF BROS. & CO., INC.
45 EAST 17th STREET, NEW YORK CITY
FOR UNIFORM SATISFACTION

Blackhawk announces its

NEW G.V.W. JACK DESIGN

The most dependable jack line ever built **now offers EVEN MORE stamina to handle today's greater G.V.W.'s, greater lifting spans and broader range of hydraulic jack applications.**

Whatever the rig and its G.V.W. (gross vehicle weight), there's a newly designed Blackhawk Hydraulic Jack with the right capacity and lift— to handle the job more quickly and surely— without need for blocking up or unloading.

DESIGN IMPROVEMENTS

other than those captioned (at right) are: ONE HANDLE now fits all models, 3 through 20 tons; and 68% of all parts for these models are also INTERCHANGEABLE — assuring lower maintenance and repair expense. You get FULL PUMP ACTION with every stroke because of new self-centering ball check design.

Stronger plungers resist side strains Longer screw extensions fit all axle heights

New tough malleable iron top cap supports off-center loading and gives solid rigidity to entire jack

Improved oversize malleable iron pump beam takes abuse and reduces wear.

Improved long-lived steel pump with micro-finished steel housing— not a casting Readily replaceable

Only by Standardizing

on Blackhawk can you get the benefits of this new "G.V.W. Jack design," cut your overall Jack costs and insure more dependable performance. 1½ to 100-ton capacities. Order from your Blackhawk Jobber.

Only Blackhawk Jacks are tagged with the "Service Proved" Seal

DEPENDABILITY SEAL OF Service Proved QUALITY PERFORMANCE

BLACKHAWK®

A Product of Blackhawk Mfg. Co., Dept. J-1224, Milwaukee 1, Wis.

For 26 years, majority of shops winning "Bus Transportation" maintenance awards choose Blackhawks.

Consulting Dept. . .

Continued from page 53

1952, we changed 218 tires with an average life of 94,100 miles per tire." —*L. P. Reilly, Supt. Eqpt., Chicago & West Towns Railways, Inc., Oak Park, Ill.*

Does Not Balance • "Incorrect toe-in causes more tire wear than any other steering angle misalignment; at the same time it is the easiest misalignment to correct. For that reason we think this check should be made at regular intervals; on our property this is done every 8,000 miles or approximately every two months. Toe-in adjustment is made with a toe-in bar to bus manufacturer specifications. From zero to 1/16 in. normally is specified. Obviously, however, before the toe-in adjustment is made, the steering gear, steering connections and wheel bearing must be adjusted correctly. We do not use a 'weegee' board on our property; wheel aligning instruments are supplied by the Manbee Equipment Co.

"For city operations such as ours, we consider wheel balancing unnecessary as our buses seldom reach a speed of 45 mph. and when they do it only is for a very short period of time. However, we do believe that for interurban service, wheel balancing will improve tire life.

"Complete front end checks are made on our property only in the following instances:

1. When a bus comes into the main shop for major repairs approximately every two years.

2. After a bad accident in which the front end is involved.

3. When improper steering such as shimmy, hard steering, etc., is reported.

4. When abnormal tire wear is encountered on front wheels."—*David J. Munro, Supt. Autobus Maintenance, Montreal Transportation Commission.*

Balance Now and Then • "Prior to 1949 we used a stick gage to check toe-in on front wheels. Our tire mileage at that time was under 50,000 average for the fleet. We lost a considerable amount of tire life due to scuffing of the tires which in turn caused

Continued on page 130

*In a recent survey, fleet maintenance men were asked, "What brand of engine bearings do you use in your service work? "53% *said "Federal-Mogul".*

Whatever your engine bearing needs may be, you will find the best answer in the red-and-black Federal-Mogul package!

FEDERAL-MOGUL SERVICE

(Division of Federal-Mogul Corporation)

DETROIT 13, MICHIGAN

The Consulting Department . . .

Continued from page 128

shimmy to such degree it could be corrected only by installing new tires. We then purchased a Bear scuff gage and mounted this device across the front end of our inspection pit. The gage was reinforced so as to eliminate flexing. Because the gage was installed on the pit it was easy to use and the men had no objection to using it.

"Since the Bear gage has been in use our tire life has increased 50 per cent, which is a quite substantial amount. Not all of the increased mileage can be attributed to the use of the gage. Part is due to alternating the front tires from one side to another at intervals. Change is made on a wear pattern basis and is performed by night inspectors when in their judgment the tires should be switched.

"Our coaches are checked with the scuff gage every 6,000 mi or when a report is turned in on steering difficulties. Wheels are balanced only on buses where repeated reports of trouble persist and after all means of corrected trouble by regular methods have been tried."—*V. E. Zimmerman, Supt. Maintenance, Harrisburg Railways Co.*

BIG . . .
SMALL . . .
CLEAR . . .
or COLORED
IF IT'S AN AUTO LAMP TUNG-SOL MAKES IT!
TUNG-SOL®
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TUNG-SOL ELECTRIC INC., Newark 4, N. J., Sales Offices: Atlanta • Chicago • Columbus
Culver City (Los Angeles) • Dallas • Denver • Detroit • Newark • Philadelphia • Seattle

Further References on Front End Geometry

How wheel-balancing is saving $9,000 a year for the New Jersey interstate operator, the DeCamp Bus Lines. See article "Wheel Balancing Does the Trick" pages 44 & 45 January 1953 BUS TRANSPORTATION.

Here is a list of makers of equipment for wheel aligning and wheel balancing:

Bean Mfg. Co., John, 1305 Cedar St., Lansing, Mich.

Bear Mfg. Co., 21st St. and 5th Ave., Rock Island, Ill.

Bee Line Co., Davenport, Iowa.

Bennett Feragen Inc., South Bend, Ind.

Bull's Eye Wheel Balancer Co., 233 Mayo Bldg., Tulsa, Okla.

Duby Co., John F., Dorchester, Mass.

Hunter Engr. Co., St. Louis, Mo.

Lee Co., K. O. Aberdeen, S. D.

Manbee Equipment Co., 185 N. Wabash, Chicago, Ill.

Manley Mfg. Co., Div. American Chain Co., York, Pa.

Motor Wheel Corp., Lansing, Mich.

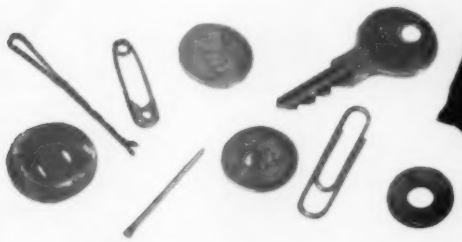
Snap-On Tools Corp., Kenosha, Wis.

Speedmaster Co., Des Plaines, Ill.

Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

Testing Apparatus Inc., Detroit, Mich.

Weaver Mfg. Co., 2177 S. Ninth St., Springfield, Ill.

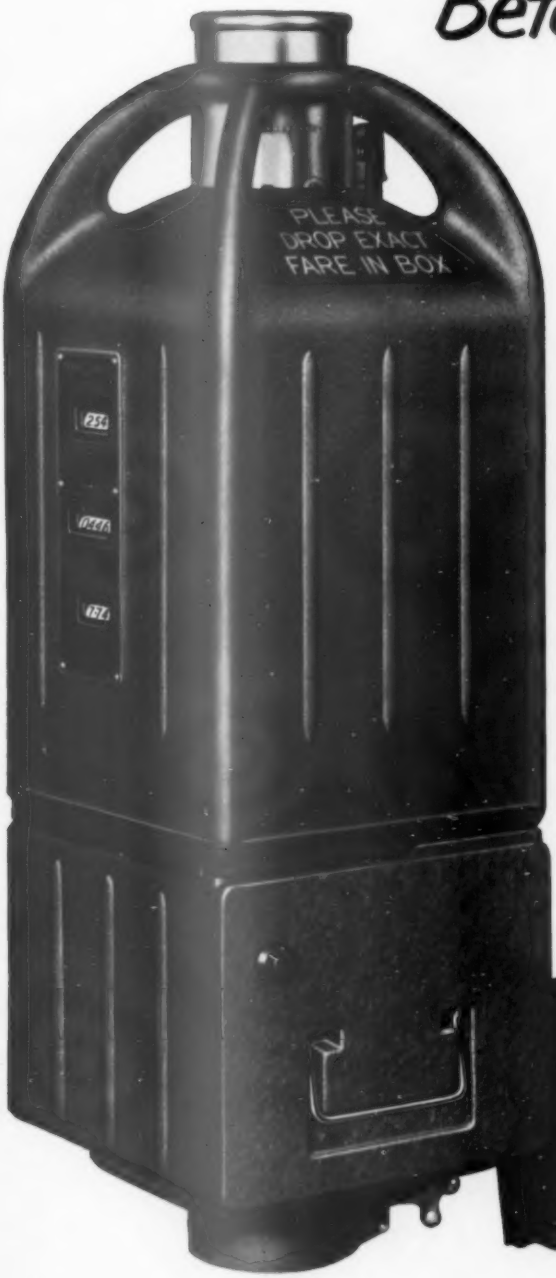


ROCKWELL **Ohmer** CLASS 124

LOCK-O-MATIC

FARE REGISTER

STOPS TROUBLES *Before They Can Start*



THIS MACHINE POSITIVELY REJECTS MUTILATED COINS AND FOREIGN OBJECTS

Expensive and troublesome road trips to changed jammed fare registers are a thing of the past when you install Ohmer Class 124 Lock-O-Matics. That's because Rockwell engineers have developed a simple, effective coin feeding and registering mechanism that positively prevents multilated coins or other foreign materials from interfering with register operation.

Excessively bent or distorted coins and other non-registerable objects are automatically culled out *ahead* of the coin sorting mechanism to prevent jams. Such rejected items are manually dumped by lever action into a locked-in multilated coin box provided for such emergencies. As an added safety factor the register will not operate when this lever is open.

Positive mutilated coin rejection is just one of a great many money making, money saving features in the Class 124 Lock-O-Matic. All are described in detail in a new catalog just off the press. Write for your copy today.

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Register Division • Pittsburgh 8, Pa.

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This is a statement of fact—proved by every property that has tried the Mack *Thermodyne* Diesel.

Up to 28% better fuel mileage! Proved in everyday fleet service and also when matched against new competitive demonstrators all over the country, the Mack *Thermodyne* Bus Diesel has invariably delivered convincingly better fuel mileage—even when the fleets contained a number of smaller buses powered by four cylinder engines! In addition, lower-priced No. 2 fuel oil is recommended.

Maintenance no problem! Traditional Mack simplicity, strength and accessibility are all retained. Only appreciable change is in the design of the combustion system—which is superior to all previous systems yet contains no new or untried elements. Low replacement parts costs, together with ease of maintenance and less need for repairs mean additional important savings to you.

here's how you can prove it yourself:

Naturally, you want to have personal proof that these claims are valid. All you have to do is contact your Mack representative, branch or distributor and have a *Thermodyne* Diesel Bus Demonstrator put to work on one of your toughest routes. Match its economy against that of your newest and thriftiest units . . . and particularly against other demonstrators. That's the best proof you can get that the Mack *Thermodyne* Diesel is the new economy champion of American bus powerplants.

MAKE MORE MONEY WITH

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Bus Division
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Factory branches and distributors for service and parts in all principal cities. In Canada: Mack Trucks of Canada, Ltd.

1884

PASSENGERS and drivers agree—a bus equipped with Solex Heat-Absorbing Safety Glass provides greater traveling safety and comfort.

That's because Solex is a very special glass. It reduces sun glare, a major cause of discomfort to everyone—and keeps the bus interior cooler by reducing the amount of solar heat that enters the bus. Actually, Solex admits 70% to 75% of the total solar light, while absorbing up to 50% of the total solar heat. So you get more safety and comfort, and less eyestrain and fatigue.

You can have this added comfort and safety in your buses by specifying Solex in your new equipment and by beginning a planned program of replacement with Solex in your present buses. All the well-known types of Pittsburgh Safety Glass—Duplate, Duolite and Herculite—are available in green-tinted Solex. Pittsburgh Plate Glass Company, Room 4120, 632 Fort Duquesne Boulevard, Pittsburgh 22, Pennsylvania.

More comfort in your offices and terminals with Solex

Solex is also available in Plate Glass for single glazing, as well as in Twindow—the window with built-in insulation. Because it reduces sun glare and shuts out up to half the existing solar heat Solex can make your offices and terminals more comfortable for working personnel and waiting passengers. See your Pittsburgh Plate Glass dealer.

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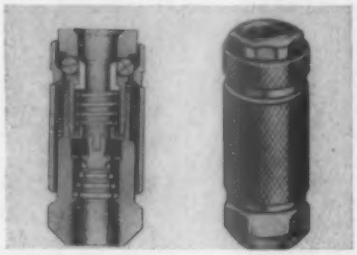
WHAT'S NEW

Continued from page 46



Detachable Air Coupler

A new light weight, quick-detachable air coupler has recently been announced. The new air coupler is said to offer 35 per cent greater air flow, yet weighs only 4½ ounces. The manufacturer states that the extra large air passage permits flow of 70 cu ft of free air per minute at 150 psi.

Instant coupling action eliminates twisting or turning, instantly couples or uncouples with one push or pull. Automatic air check valve shuts off flow of air when coupler is detached from nipple. Free swiveling of coupler on nipple prevents kinking of air hose. Coupler cannot be detached accidentally. More information is available from *Lincoln Engineering Company, 5701 Natural Bridge Avenue, St. Louis 20, Mo.*

New Tread for Safe Footing on Ladders

This new tread is formed from a single piece of heavy gage steel which is cut, punched and raised as shown

Continued on next page

Two-D Mirror Eliminates Blind Spots

• A NEW 2-D MIRROR to eliminate blind spots in driving is being marketed by a Phoenix, Ariz., man—as the result of an accident.

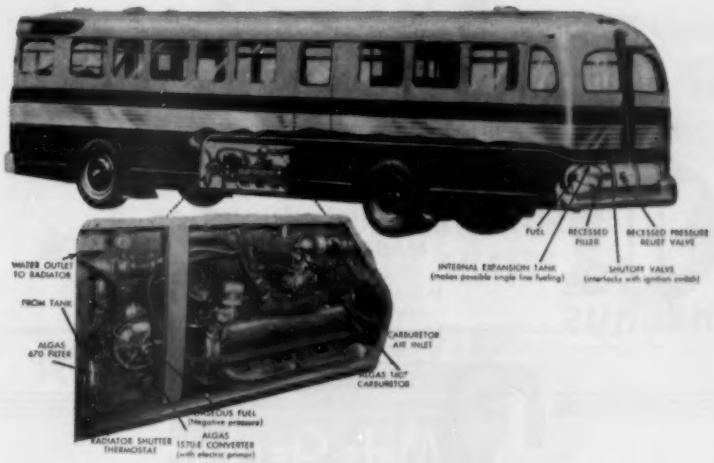
When a commercial refrigerator dealer, G. W. Lance, bent to pick up the pieces of a mirror he had dropped, he noticed that they were arranged to give him a wide view of his shop.

His mirror consists actually of two mirrors placed at an angle in a single frame. The mirror is so arranged that the driver can see cars overtaking him which were previously hidden by blind spots.

The mirror covers the left-hand lanes until the passing cars are even with the driver.

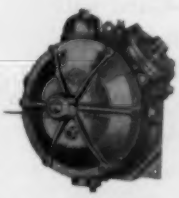
The unit is installed on a short arm on the driver's side of the automobile, truck or bus.

DOUBLE your engine life



with LP-GAS...the modern fuel

Thousands of truck owners and bus operators have found that LP-Gas is the answer to their engine overhaul problems. LP-Gas is a dry burning fuel that does not dilute the oil or cause washdown of cylinder walls. Case history after case history on trucks and busses have shown longer engine life, fewer oil changes, lower upkeep and *savings in fuel costs.*



ALGAS 1570-E CONVERTER WITH ELECTRIC PRIMER

ALGAS 1600 MIXER

ALGAS is a pioneer in the LP-Gas field. We have engineered carburetion conversion equipment for the trucks or busses you own. Investigate the many advantages of LP-Gas today. Write now for our informative folder, "LP-Gas... the modern fuel."

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SPRING TONIC for AILING SLUDGE-BOUND ENGINES!

Maybe a "tear-down" is needed. But in a great many cases, *without dismantling*, Magnus 755 will remove the sludge that makes your trucks and buses lazy. It takes just about an hour . . . and it's safe and sure.

Write for the complete story on Magnus 755 for de-sludging without tear down.

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Use Moto-Gard to reduce Maintenance Costs and insure Longer Life for Your Motors. Moto-Gard will protect your Motor against Damage from an Oil Failure or Overheating. It automatically stops the Motor Ahead of Any Damage if the Oil Pressure runs too low or the Motor gets too hot. MOTO-GARD will make your equipment Safer and More Profitable.

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"Don't Buy Motors—Buy Moto-Gard"

THE MOTO-GARD COMPANY

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WHAT'S NEW

Continued from page 135

in the illustration. The edge of each half of the raised steel is serrated to furnish positive non-slip foot grip, regardless of types or condition of footwear. Metal chips, or fragments, oil-soaked paper or other objects which might tend to cause workers to slip and fall on smooth treads, are scraped from shoe soles by the raised edges. Objects removed are not retained on the steps as a future hazard because the design permits dirt and picked-up material to drop through holes in the tread. *Ballmore Company, Wayne, Pa.*

New All-Purpose Vise

A new all-purpose vise that is said to work equally well in any upright or on-its side position is now on the market. The new vise operates from, and rotates around, a standard base which can be mounted in any desired location. Additional bases can be placed in different parts of the home, garage or shop and the vise easily moved from job to job.

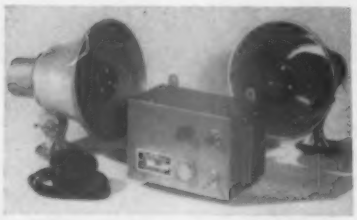
Regardless of its position, upright or flat, the vise is said to be able to move in a full circle. It locks automatically in any selected position. The vise jaws are 2½ in. wide and 4¼ in. deep. Maximum jaw opening is 5 inches. The manufacturer claims that these jaws will also hold paper-thin objects securely and without marring. *The Columbian Vise & Mfg. Company, Cleveland, Ohio.*

Oakite's New Cleaner

Composition No. 72, a new material for vehicle body washing, has recently been announced. The new material, according to the manufacturer, is a

mild alkaline cleaner that dissolves readily in hot or cold water, and rinses freely. Said to possess exceptional wetting out ability, it is recommended for use at between 2 to 6 ounces per gallon of water, and it may be heated to 145 deg. F.

The manufacturer suggests that the surface to be cleaned be first wet down with a pressure spray, after which the solution is applied by brush, automatic washer, or foam spray unit. It's stated that this solution eliminates problems that arise from solvent saturation of wire coverings and insulation, and that it is safe for both operators and equipment. *Oakite Products, Inc., 1160 Rector St., N. Y.*



Vehicular Public Address System

A new and unique vehicular public address system known as "Mobilfone" which employs no tubes, vibrators, or other fragile components recently was announced. According to the manufacturer, the new system is an improvement on present day electronic public address systems in vehicular applications due to its voice reproduction plus the fact that it completely eliminates costly and expensive tubes, vibrators, and other components required in the conventional system.

Special shakeproof loudspeakers, specifically designed to give good voice frequency response, are employed. Ignition noise is reduced below audiability by a special high Q network located in the filter-control unit. Mobilfone was developed with the co-operation of the Grayline Sightseeing Company of Chicago. *Midwest Auto Service, 931 Forest Avenue, Evanston, Ill.*

New Heavy-Duty Hose

A new flexible radiator hose that comes in 15 sizes for heavy-duty vehi-

Continued on page 139

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★ **REPAIRS ON BUS ARMATURES SPIRAL STARTER SHAFTS**

★ **REMANUFACTURED BUS ARMATURES**

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Shop here for DeVILBISS spray guns that fit your bus maintenance jobs exactly!

P-JGA—502

For volume work

Need a rugged, versatile spray gun for rapid coverage, maximum speed, volume output? Choose the compact DeVilbiss P-JGA! Its light weight, perfect balance and easy operation keep operator fatigue to a minimum.

Large air and fluid passages give this model extra capacity to thoroughly atomize a great volume of material and apply it uniformly under all operating conditions.

For fast material changes

P-MBC—510

The DeVilbiss P-MBC, most extensively used spray gun ever built, sprays anything you can pour. Completely removable, interchangeable heads let you change colors or materials instantly, without cleaning or flushing. Wide range of spray patterns.

For large and small jobs

P-CM—501

For a production-type gun at an economy price—where you operate with a limited air supply—the DeVilbiss P-CM gun is for you! Sprays all commonly used, light-bodied liquids. Nozzle variety permits use from pressure feed tanks or suction cups.

For spot work

P-TGA—501

For smaller jobs, requiring finest quality finishes, DeVilbiss offers the P-TGA. Ideal for general touch-up, finishing small areas, interiors, special effects. Applies all types of regular finishing materials from pressure feed or suction.

For light-bodied materials

P-GDS—532

The DeVilbiss P-GDS is specially built for applying fast-drying or light-bodied materials — wax, lacquer, synthetics, varnish — with low air consumption. Also suitable for minor touch-up work. Operates from compressors down to ¼ h.p. Sprays a 6" pattern.

For touch-up and stencilling

P-EGA—502

Here's the DeVilbiss P-EGA gun for stencilling, striping and banding. This small, precision spray gun gives you extreme accuracy, easy handling with all common types of spray materials.

For under-body coating

P-MBC—565

Get the DeVilbiss P-MBC—565 model, to apply all types of heavy materials: undercoating, sound deadeners, dumdum, mastics. Non-plugging, large-diameter fluid passages. Rugged and dependable. Operates from pressure-feed tank only.

Call in a DeVilbiss jobber, today!

Shop this page for the spray guns that fit *your* exact requirements. Then call in your DeVilbiss jobber—he's listed in the classified pages of your phone book. He'll show you how DeVilbiss products—Spray Guns, Spray Booths, Air Compressors, Hose and Connections—help you get jobs out faster, more efficiently, *at a lower cost!*

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WHAT'S NEW

Continued from page 37

cles is now on the market.

The ends are beveled for easier installation, and a sturdy grease resistant jet black cover with a steel coil spring, plus a specially treated lining, are other features of the new hose.

Additional information can be obtained by writing to the *Norbalt Rubber Corporation, 51 East 42nd Street, New York 17, N. Y.*

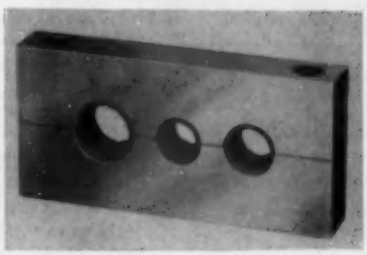
Bumper Towing Chain

A new towing aid that is said to be attachable to all types of light vehicle bumpers—wide or narrow—is now on the market. The bumper towing chain is 8 ft 8 in. long and made of heavy 7/32 in. diameter, high grade steel with coppered rust resistant finish. Three link adjustment sections are attached to each end of chain by sliding rings.

Bumper gripping action is provided by 4 hooks—2 coppered hooks (1 at each end of the chain itself) and 2 zinc plated hooks (1 at one end of each of the two coppered three-link adjustment sections.) According to the manufacturer, the chain will not loosen on any bumper as top and bottom hooks hold snugly even when chain itself is slack. *American Chain Division, American Chain & Cable Company, Inc., Bridgeport 2, Conn.*

Self-Adhesive Aisle Markers

These new aisle markers are made of durable, colorful plastic, backed with a heavy duty, pressure-sensitive adhesive. They are said to stick fast to any clean, dry floor without moistening. Any unskilled worker can make curved or straight lines quickly and without costly machinery. Because the aisle markers are only 0.005-in. thick, they lie flush with the floor . . . won't obstruct pedestrian or vehicular traffic. The durable plastic surface of the markers is resistant to abrasion . . . will outlast painted lines 5 to 1, it is claimed. Acids, oil, grease, salts, water and most common solvents have no effect on the markers, according to the manufacturer. If a marker becomes damaged, only that marker is replaced . . . no others need be disturbed. Because they're removable, the aisle markers are no problem when departments are rearranged or when production lines are changed. *W. H. Brady Company, 727 West Glendale Avenue, Milwaukee 12, Wisc.*



Two New Cable Tools Save Time in Field

Two new tools which are said to simplify and save time in making up and assembling speedometer cables

Continued on next page

Low cost air

How much does your compressed air cost?

Probably more than you think. The biggest cost in compressed air isn't the price of the compressor; it's the operating cost: the power needed to produce each cubic foot of air, the amount of service and repairs needed. That's why it will pay you to replace your old or inefficient compressor with a DeVilbiss Air Compressor. You'll save on power, upkeep and depreciation. *DeVilbiss Air Compressors deliver more air for the money.*

For a complete analysis of your compressed air needs, contact your local DeVilbiss jobber.

DeVilbiss has an Air Compressor to fit your needs, from ½ to 15 hp., single or two stage, Upright or V Type.

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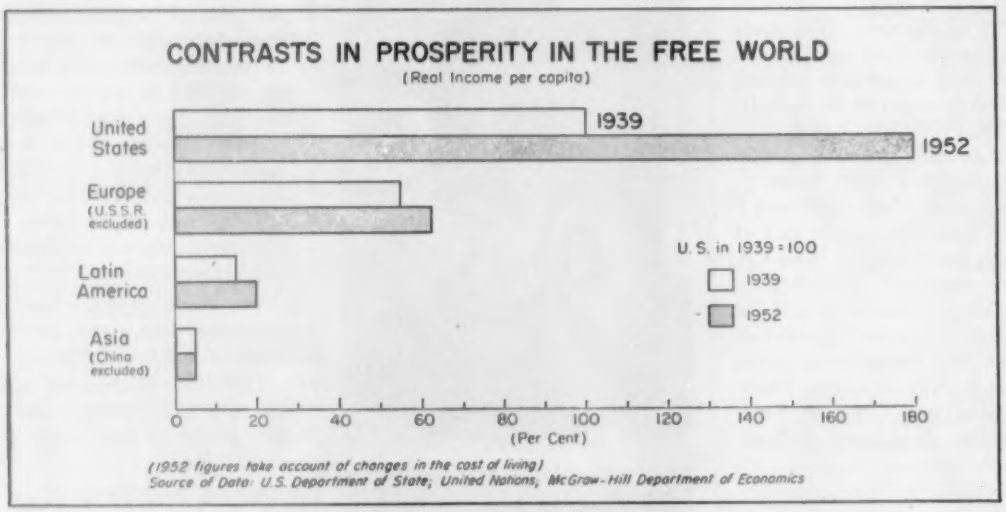
Contrasts in Prosperity Endanger the Free World

The chart in the middle of this page summarizes a situation of profound importance to every American. It shows that:

1. On the average, Americans are vastly better off economically than most other people in the free world, and
2. In recent years the gap in income between the average American and the average European, Latin American or Asian has greatly widened.

A Mounting Contrast

Even greater is the contrast between the real incomes of Asians and Americans. Today most Asians are no better off economically than they were back in 1939. On the other hand, the real income of the average American has almost doubled. As a result, the real income of the average Asian—always small by our standards—is now only a tiny fraction of that of Americans.



The chart shows that, at the outbreak of World War II, the real income (that is, actual purchasing power of income) of the average American was substantially higher than the average European's and much higher than the average Latin American's or Asian's. Since then, the European and Latin American have become better off. But the improvement in the economic lot of the average American has been so great that the others have been left far, far behind.

It must be remembered that the figures used to construct the chart are of varying quality. The fact is that few of the poorer countries have reliable statistics. However, it is generally agreed among competent observers, that the figures here presented offer a correct impression of the wide disparity in the average of real incomes between various parts of the free world. The figures, of course, have nothing decisive to say about spiritual and cultural values. In these, coun-

tries with relatively little material prosperity may be rich.

It is possible to draw a variety of morals from the story of lagging growth of income in other parts of the world. For one thing, it reflects the dynamic force of private enterprise. Private enterprise is characteristic of our economy far more than it is of most of the other free economies. The chart also reflects the fact that we are bountifully blessed with the natural resources essential to a high level of real income. Moreover, we did not suffer from the devastation and waste of two world wars as did many of the other free nations.

Narrowing the Gap

But perhaps the most important message which the chart conveys is one of warning. It warns that something must be done to narrow the gap in prosperity between America and other parts of the free world, if that world is to be united successfully in the struggle against totalitarian Communism. Writing in the HARVARD BUSINESS REVIEW, Kenneth E. Boulding recently put it this way:

> *"The crux of the problem is how to raise the three-quarters of the world that live on a low level to the high level of the other quarter, for it is precisely this wide disparity that makes our world so unstable. American-Russian relations, for instance [are] . . . complicated almost unbearably by the fact that each power is competing for the support of the vast fringe of underdeveloped countries . . . These countries are dissatisfied with their present state and are hovering between the two cultures, wondering which offers them the best chance of shifting from their present low-level to a high-level economy."*

Very real danger threatens from any feeling which may develop in the less fortunate free nations that our enviable economic progress has been made at their expense. Instead of viewing the American economic system as a model that might be followed by their own countries, they may be led to see in it a menace to their well-being. If Communist propaganda can persuade these people that their alliance with the free world will only result in their dropping farther and farther behind an increasingly prosperous United States, they will be driven to the side of totalitarianism.

Test of Effective Leadership

How can these free nations on the lower half of the income ladder be helped to alleviate the conditions that keep them there? Surely this question poses a whole series of complicated problems. Yet, if we do not exercise some effective leadership toward their solution, we can be sure that Russia will take advantage of the situation. In these circumstances, it is essential to both the stability and security of the free world that we help our less prosperous neighbors make satisfactory headway.

This does *not* mean that the United States should sacrifice its own economic progress in favor of some sort of global leveling scheme. On the contrary, a continually expanding and stronger economy is essential if we are to provide any real aid to our friends. Also, it goes without saying that our friends must be disposed to do all they can to improve their own economic position, if our cooperation to that end is to be effective.

Great Skill Required

Our part in a program to achieve this goal calls for a high degree of skill and statecraft. It involves international trade policy, which, in itself, presents a perplexing range of problems. It involves also programs of foreign technical and economic assistance. And expanded foreign investment must play a key role in a balanced program to strengthen the economies of the free world for our common good.

The Commission on Foreign Economic Policy, headed by Clarence Randall, has recently submitted a report, embodying the results of a monumental inquiry into our foreign economic relations and measures to improve them. From the very nature of the subject, discussion of the report is bound to be attended by much controversy and conflict. However, an awareness of the facts presented by this chart should inspire us to accord to the problems posed by the Randall Commission the careful and sober consideration they must have if any real progress is to be made in raising the general standards of human well-being throughout the free world. Our willingness and ability to do this have now become the real test of our statesmanship, both at home and abroad.

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...let Trans-Main recondition your SPICER MODEL 916 Torque Converter Planetary Pinion Spiders!

You'll agree that the necessity for frequently replacing planetary pinion spiders on Model 916s has long been a major maintenance headache.

Now—Trans-Main has developed a new method of reconditioning old spiders. This makes them as good—probably better—than new. And—it saves you over $50 per unit on replacement costs.

1. Trans-Main completely remanufactures old pinion spiders to their original tolerances.
2. Trans-Main also remachines spiders (of old style) and installs tab washer flats to make them conform to those of current design. Underside is likewise remachined for correct cage clearance.

Price $18.75

thrust pads restored to original tolerances

tab washer flats installed on old models

TRANS-MAIN CORPORATION KENT, OHIO

Ask for copies of "Transit Maintenance Topics," a service bulletin containing the latest transit maintenance news.

Kent, Ohio

TRANS-MAIN CORPORATION

WHAT'S NEW

Continued from page 139

and casings from bulk stock have recently been made available. According to the manufacturer, the new tools make it possible to quickly make up cables and casings in the field, regardless of length or terminal connection.

One of the tools is known as a "Cable Staking Tool." (Top photo) It is constructed with cutoffs for both .130 and .150-in. diameter cables. Provision is also made to square cable ends and assemble collars and fillings. Holes are provided for bench mounting of the tool, which measures 4 by 6 inches.

The other is called a "Casing Swaging Tool." (Lower photo) It has provision for swaging ferrules to 0.260, 0.316 and 0.437-in. diameter casings. This tool can be used in either an arbor press or vise, and measures 3 x 1½ x ½ inches. Additional information can be obtained by writing to *AC Spark Plug division of General Motors, 1300 North Dort Highway, Flint 2, Michigan.*

Speed Your Filling and Save Your Fuel

Filling and venting systems of fuel tanks should be designed...

(a) To provide for fast pumping speeds without blowback.

(b) To eliminate spillage due to overfilling.

(c) To provide an expansion zone *within the tank.*

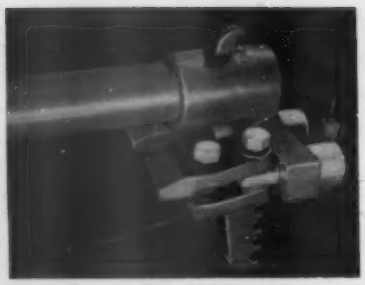
You gain these filling advantages when the tank is equipped with a VENTALARM Signal. You also avoid the extreme hazard of spillage on garage floors due to temperature changes. For with VENTALARM Signal, there is no excuse for filling up into the filler neck.

On all new equipment, specify

VENTALARM®
WHISTLING TANK FILL SIGNAL

"Just fill 'til the whistle stops."

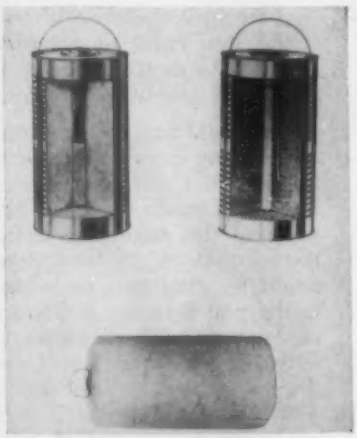
SCULLY SIGNAL COMPANY
174 Green St., Melrose 76, Mass.



New Pull Clamp Attachments

A new pull-clamp that is said to provide lighter, faster, more compact pulling assemblies for body repair and reconditioning with Porto-Power is now being offered. According to the manufacturer, the new clamp with forged jaws give a positive grip for pulling out dents in sheet metal panels. Chains are completely eliminated.

The new fender clamp has adjustable, forged jaws that reach over beaded edges or fender moldings. Both clamps can be used for single or multiple grip and are interchangeable with Bantam and 10-ton equipment. With other Porto-Power attachments they can be used for pulling over a high crown or concave surfaced body panels. Additional information can be obtained by writing to *Blackhawk Mfg. Company, Milwaukee 46, Wisc.*



Heavy Duty Oil Filter Cartridges

To suit various types of service and individual maintenance schedules, a selection of three heavy duty oil filter cartridges for 750 series filters has recently been announced. To service WIX filters WF-750 and WF-750-C, and Luberfiner filter 750,

1500 and 2250, there are the company's stock type cartridge CW-750 and the can type CW-750M, both containing WIXITE, and the can type CW-750-MS containing a special filtrant of absorbent paper and wood flock. WIXITE is a resilient density filtrant—white cotton thread blended with springy wood fibres to prevent matting and channeling.

The new CW-750-MS filtrant consists of paper and wood flock plus a special plastic bonding agent. It is heat treated at controlled temperatures to provide filtering efficiency, high flow rate and long life in heavy duty service. According to the manufacturer, no WIX cartridge removes detergents or other additives from heavy duty oils. *WIX Corporation, Gastonia, N. C.*

New Safety Device

A new safety device, the three-star-safety-flater recently has been introduced to the transportation industry. The safety-flater is said to be a simple device for protecting the operator when inflating vehicle tires, and a protection from danger of blown lock rings.

The operation is said to take only 5 seconds and consists of placing the safety-flater in the middle of the wheel, pressing the trigger release and extending ends to cover the lock ring. According to the manufacturer, this gives three point protection and enables owners to meet insurance underwriters' specifications for safety. *Jack P. Hennessy Sales Company, P.O. Box 22, Audubon Station, New York 32, New York.*

Liquid and Air Cleaning Gun

A new, triple-purpose sand blast, liquid and air cleaning gun under

Continued on next page

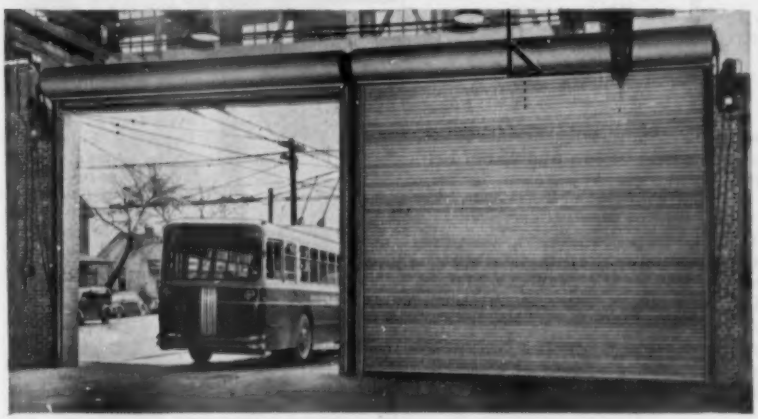
KINNEAR Rolling Doors

Clear The Entire Opening

You get full use of all doorway space when you equip openings with Kinnear Rolling Doors. They clear the doorway completely—from jamb to jamb and from floor to lintel. Even the floor, wall and ceiling space *around* the doorway remains clear and usable at all times.

The doors rise straight upward, coiling above the lintel. Buses can be parked within inches of the door curtain, both inside and outside the entrance, without blocking door action in any way.

The rugged all-steel construction of Kinnear Rolling Doors assures an extra measure of protection against theft, intrusion, storm damage, and fire. Kinnear Rolling Doors are built any size, with manual, mechanical or motor operation. Trolley bridges that operate automatically with the doors are also available. Write for complete information.



The KINNEAR Manufacturing Co.

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SAVING WAYS IN DOORWAYS KINNEAR ROLLING DOORS

NEW Precision made parts are necessary to restore worn shock absorbers to guaranteed dependable performance.

Practical economy-wise maintenance men are taking advantage of our fast reliable service.

All new parts are manufactured by us to obtain the high standards we employ in remanufacturing your shock absorbers. **Precision assembling assures dependable performance.** We are completely equipped and qualified by experience to render the prompt service you need. Send your worn shocks to us and save dollars.

National Transport Supply, Inc.

SHOCK ABSORBER, STARTER DRIVE AND WATER PUMP SERVICE

OFFICE AND PLANT

543 E. Hancock **Detroit 1, Mich.**

WHAT'S NEW

Continued from page 141

the trade name of "Carco" is now on the market. It is said to be a precision built, low cost hand gun, highly efficient for cleaning small parts and surfaces with sand, liquid or air. The gun operates on air pressure of 75 lb. and up. Maximum efficiency for sand blasting is obtained with air pressures of 100 to 140 lb.

The complete kit contains the gun, three extra hardened steel nozzles, extra hardened steel jet, a glass sand container with cap, machined brass fittings, a three foot rubber hose and a convenient wrench for removing and installing the jet. The gun is said to be ideal for cleaning spark plugs, removing paint and rust, removing carbon, cleaning welds, cleaning radiators, cleaning corroded parts art work on glass, etc. Detailed information can be obtained by writing to *C. A. Roesch & Co., 1221 South Hope St., Los Angeles 15, Calif.*

PROTECT REVENUE WITH Allocated* METAL FARE TOKENS

Ideal for multi-fare and fractional fare systems. Attract riders. Speed fare handling. Eliminate change-making delays. Assure accurate sorting, counting and wrapping by maintenance of identical size. An investment . . . not an expense, for they wear indefinitely.

* Allocated . . . an exclusive M & W method of manufacturing metal fare tokens individually designed for each customer. Perforations and lettering are in the same relative aligned position on every token which makes them identical, thus protecting against duplication. This is especially important with no Federal law protection.

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Established 1854
TRANSPORTATION DIVISION
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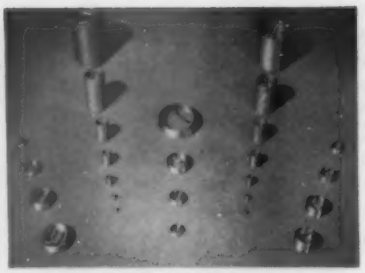


New Complete Thread Insert Line

A new full line of stainless steel wire screw thread inserts for use in the repair of worn and damaged threads in automotive equipment is now on the market. The method of thread repair is said to be fast and simple, requiring the following three steps:

- drilling out the damaged threads
- retapping with Heli-Coil taps
- installing the insert which brings the hole back to original size.

Because they are manufactured to diameters slightly larger than the hole and are installed under compression, these spring-like wide thread inserts are self locking. In comparison with conventional thread repair techniques—the oversized thread method, the build-up by welding method, and the solid bushing method—the wire insert operation is said to be faster and simpler, so that time and cost savings up to 80 per cent have been reported. *Heli-Coil Corp., Danbury, Conn.*

New Low-Cost Commercial Bearing

A new low-cost commercial bearing that is said to be finding many new uses in industry is now on the market. The bearing, the CS 3258, has been used in business machines, small electrical motors, tensioning devices, and in many other applications where speeds and loads are moderate enough to allow use of a commercial bearing. In each case the CS 3258 was used to replace a more costly precision bearing, and resulting savings ranged up to as much as 60%, according to the manufacturer.

The bearing has carburized and hardened raceways, and all surfaces are ground. Bearing is available in either English or metric sizes. *The Schatz Manufacturing Co., 6762 Fairview Ave., Poughkeepsie, New York.*

ATA Meeting . . .

Continued from page 61

information on as higher levels of management.

The afternoon session of the management conference took up the problem of transit and traffic congestion as now being emphasized in the ATA Public Information Program. Also discussed were methods successfully used to relieve traffic congestion and promote safety. The first day session closed with an open forum discussion on claims and insurance problems, significant fare and labor developments and other general problems of management.

Refinery Inspection Trip • The Purchases and Stores Division opened its conference with an all-day field inspection trip to one of the largest and most modern lubricating oil and fuel refineries in the world. Some 40 ATA members and guests took this trip which was arranged through the courtesy of Cities Service Oil Co. The visitors were flown from New Orleans to Lake Charles, where the plant is located, in a chartered Eastern Airlines plane. After luncheon and plant tour the group was flown back to New Orleans.

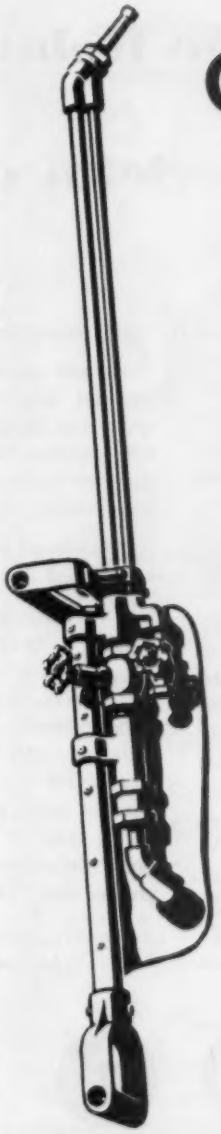
Meeting in a business session the following day, the Purchases and Stores division heard the chairman's report of the committee on Fuels and Lubricants, by Robert Sloan, Third Avenue Transit System. This was followed by a film on "Motor Fuel with a Future" through courtesy of Phillips Petroleum Co. Another film in color showed the development of the diesel racing car by Cummins Engine Co.

The propane installations and storage facilities at San Antonio was discussed by J. H. Powell, assistant to the president. San Antonio operates ten million miles a year and operates 89 per cent of this mileage on propane. Cost of converting its fleet for this fuel as well as installation of fuel storage and handling equipment is placed at $200,000 according to San Antonio officials. Savings effected by the use of this fuel in the three years ended January 1, 1954 has returned to the company 116 per cent on its investment, it is stated.

Continued on page 145

your best bet for better steam-detergent cleaning

OAKITE
Composition No. 92



Today, more and more fleet owners are relying on steam cleaning for expediting such tough jobs as reconditioning chassis, cleaning motor blocks and stripping paint. But, for best all-around results and economy, careful thought should be given to the selection of the *right* cleaning compound.

Oakite Composition No. 92 is a performance-proved detergent. It is specially designed to give expert results wherever steam-detergent cleaning is applicable. Consider these important advantages found in Oakite Composition No. 92:

- **Dissolves readily in hot water**
- **Cleans thoroughly at 2 oz. per gallon**
- **Doesn't clog steam coils**
- **Prevents hard water scale**
- **Gives off no offensive fumes**
- **Safe, pleasant to use**
- **Rinses freely from all surfaces**
- **Does not harden in storage**

Write for complete details on Oakite Composition No. 92. Also request illustrated folder describing the many available models of Oakite Steam-Detergent Guns. Oakite Products, Inc., 16C Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

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MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

To the Employee Relations Director of every American company

LET'S FACE IT . . . the threat of war and the atom bomb has become a real part of our life—and will be with us for years. Fires, tornadoes and other disasters, too, may strike without warning.

The very lives of your employees are at stake. Yours is a grave responsibility. Consider what may happen.

When the emergency comes, everybody's going to need help at the same time. It may be hours before outside aid reaches you. The best chance of survival for your workers—and the fastest way to get back into production—is to know what to do and be ready to do it. To be unprepared is to gamble with human lives. Disaster may happen TOMORROW. Insist that these simple precautions are taken TODAY:

☐ **Call your local** Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safer, because it's entirely integrated with community Civil Defense action.

☐ **Check contents** and locations of first-aid kits. Be sure they're adequate and up to date. Here again, your CD Director can help—with advice on supplies needed for injuries due to blast, radiation, etc.

☐ **Encourage personnel** to attend Red Cross First Aid Training Courses.

☐ **Encourage your staff** and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good employee relations—and no greater way of helping America.

Act now . . . check off these four simple points . . . before it's too late.

ATA Meeting

Continued from page 143

Other subjects on the P & S program were reports and discussions of Transit Pars, by F. H. Palmer, Grand Rapids Motor Coach and C. A. Wittcke, Fifth Avenue Coach Co. Initial Stocking and Return Material Policy was discussed by J. Harty, Chicago Transit Authority. Purchasing Practices was covered by Harry T. Smyth, Capital Transit Co. Brake Drums and Blocks, by A. H. Hatchett, Cincinnati Transit Co., Tires, by F. B. Bullock, Cleveland Transit, Batteries by E. J. Armstrong, Metropolitan Transit Authority, Springs by C. A. Wittcke and the B-54 Identification System Antifriction Bearings by C. E. Petsmeyer, Columbus Transit.

New Committee on Scheduling • Rex T. Reynolds, Director Personnel, Kansas City Public Service presided over the newly-formed Operations Division Committee on Scheduling. An interesting presentation with a long title was "The Shortest Path from the Schedule Maker's Worksheets to the Operator's Run Card, The Street Supervisors' Schedule and the Public Pocket Schedule." This was offered by L. K. Lamson, Supt. Schedules, St. Louis Public Service.

Arthur E. Kern, New Orleans Public Service discussed "Cutting the Schedule for the most effective use of Car and Bus Operators," while Michael Ihnat of San Antonio Transit took up special scheduling problems which arise with night and Sunday long-headway service.

Operations Division • The Operations Division Conference took the form of one of the popular panel discussions. These discussions are entirely unrehearsed and are based on leading questions offered by the moderator who, in this instance was Robert H. Dalgleish, Jr., General Supt. Transportation Philadelphia Transportation Co. Members of the panel were D. L. Fennell, executive vice president, Kansas City Public Service, P. E. Askey, vice president, Capitol Transit Co., Little Rock, Ark., A. J. deMayo, secretary-treasurer, American Transit Corp., H. E.

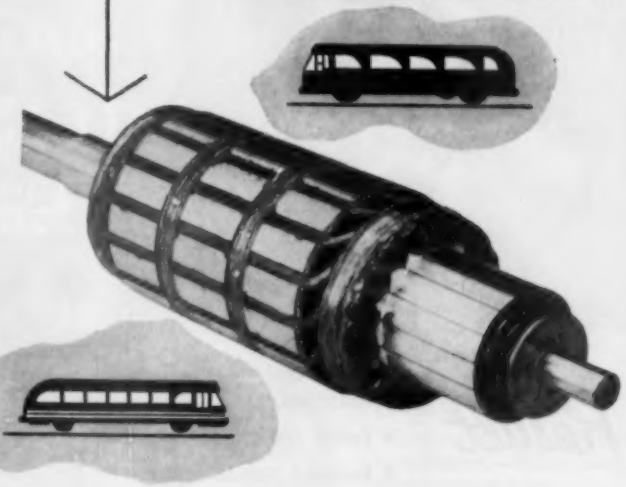
Continued on page 147

Now

for Diesel Buses...

a bar wire rewound starter armature that cuts...

Maintenance Costs



- Silver Soldered
- Lasts As Long As The Commutator
- Rewound To Factory Specifications With Rectangular Bar Wire
- Cuts Battery Drain
- Boosts Performance

For Complete Information
Write - Wire - Phone!
(Specifying Armature Number)

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PHILADELPHIA 40, PA.
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Bendix automotive Electric Fuel Pump

Result

- Lower cost per mile operation.
- Better schedules.
- Reduced service expense.

Trucks start quicker, run better and are more economical to operate in all kinds of weather when equipped with the performance-proven Bendix* Electric Fuel Pump.

For example, tests prove that engines start at 10 to 15 degrees lower temperature. In fact, dependable operation has been established at 75° below zero.

Or take the other extreme in temperature—vehicles with Bendix Pumps running in desert heat perform with utmost efficiency and never develop vapor lock.

Rain or shine, hot or cold, for lower cost per mile operation, you can't make a better investment than a Bendix Electric Fuel Pump.

Sold by independent garages and service stations. Descriptive folder available on request. Write to Dept. A.

*REG. U. S. PAT. OFF.

ECLIPSE MACHINE DIVISION

Elmira, New York • Division of Bendix AVIATION CORPORATION

Check these Features

- Instant hot weather re-starts.
- Prevents vapor lock.
- Built-in pressure release—no flooding.
- 30 gallons per hour.
- Helium sealed—for longest life.
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- Only 7 watts power at maximum fuel delivery.

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World's ONLY 100% Automatic Fare Register!

INSTANTLY checks by contrasting sounds up to 5 different coins and tokens. Is only cure for short fares and "stretched-dime" losses!

SCAVENGES bent coins. No road calls! No hand collections!

DETACHABLE, automatic change carrier—no milking! Flips coins out in any desired multiple.

SORTS all coins, tokens automatically!

GET THE FULL STORY on how GRANT ELECTROFARER will save you money—on *all* operations — Urban, Suburban, Intercity. Write us today.

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New York 36, New York

ATA Meeting . . .

Continued from page 145

Palmer, Gen. Supt. Transit Dept., New Orleans Public Service and Tom H. Owens, Supt. Traffic, Dallas Railway & Terminal Co.

The supervisory functions of servicing the line, dispatching and instruction were covered in a down-to-earth analysis of the economics of supervision. Much of the discussion centered around the relationship of the supervisor to the operator on the one hand, and the supervisor to management on the other, as well as the modern tools now available to the supervisory personnel such as automobiles, radio and telephone.

At the afternoon session O. W. Rexford, operating manager, St. Louis Public Service introduced a discussion on the problem of enlisting the operator's help in improving public relations.

Rexford described an advanced training course in customer relations as developed in St. Louis. Following his talk there was a question and answer period for the purpose of getting members of the group to tell how operators can be impressed with the importance of courtesy and help to the public; and how the operators' own welfare is dependent directly on the success of his company.

The value of individual company research in the solution of transit problems was stressed by Walter Rainville, Jr. ATA director of Research.

One of the high spots of the New Orleans meeting was a reception on Thursday evening tendered with true southern hospitality by New Orleans Public Service, Westside Transit Lines, Inc. and Louisiana Transit Company.

Operations, Maintenance and and Small Operations • Friday, closing day of the conference, was busy as a three ring circus what with simultaneous meetings held by the Operations group, the Maintenance group and the Small Operations group. Under the general heading—"Cutting the Cloth to Fit the Pattern, J. O. Speed, Supt. Trans. Birmingham Transit discussed reduction in service of individual routes; J. C. Eblin, Asst. Supt. Charleston Transit discussed the abondonment and consolidation of lines. Donald C. Hyde, general manager, Cleveland Transit System told how Cleveland uses express service to relieve local service and stimulate riding.

Hyde emphasized that mere speeding up of traffic is not the solution to transit ills; it is the speeding up of transit vehicles that is important. A gage of the effectiveness of express service, Hyde said, is if it helps to maintain the volume of riding. If it does, then the shift from public transit to private autos is halted.

The importance of increasing the speed of transit vehicles was emphasized in Hyde's statement that a gain of from one mile to one and a quarter miles per hour means a difference in revenue to his organization of more than a millon dollars a year. CTS vehicles operated at one mile an hour faster schedule speed in 1952 than they did in 1947, he stated.

Continued on next page

NEW
HEATER-DEFROSTER
SMALLER IN SIZE
BIGGER IN OUTPUT

SMALL
only 8-1/16" x 8-5/16" x 8-3/8"

POWERFUL
17,800 BTU Output

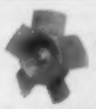
EFFICIENT
split core and tank travel water further — heat lingers longer

HEAVY DUTY
"Continuous service" bus type motor — heavy duty truck service core

ADAPTABLE FOR RECIRCULATING OR FRESH AIR
Simple to connect to top or side cowl for fresh air intake

THE NEW
EVANS ED-75
provides more heat output than any other heater-defroster of its size

EVERY EVANS HEATER IS EQUIPPED WITH THE FAMOUS EVANS UNBREAKABLE LIGHTWEIGHT FAN. Precision die-molded airfoil section blades . . . move more air with less noise and current draw . . . will not chip, crack or bend . . . unaffected by temperature . . . one piece construction.



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Diesel SHOP EQUIPMENT

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for Bosch
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WRITE TODAY for our complete Shop Equipment Manual showing these and more than 300 other testers and tools engineered specifically for Diesel maintenance and repair.

Bacharach Industrial Instrument Co.
7301 Penn Avenue • Pittsburgh 8, Pa.

ATA Meeting

Continued from page 147

Maintenance Men Swap Ideas • The maintenance men held a day-long session on Friday. The morning meeting was presided over by Henry R. DeTourney, Operations Manager, West Side Transit Lines, Gretna, La., and the afternoon session was under the chairmanship of Sid Gale, Supt. Maintenance New Orleans Public Service.

Following a pattern established as standard more than a decade ago, the maintenance conference took the form of a question and answer meeting. The questions ranged all the way from the purely technical "how-do-you-fix-it" type up to some of the more profound administrative problems of maintenance management.

While there was the usual healthy disagreement as to means and methods which characterizes any gathering where more than two maintenance men get together—and there was close to 70 at these sessions—there also was close harmony on some questions. For example, it appeared to be almost unanimously agreed that:

a—Regrooving prevents the obtaining of top mileage from tires.

b—Engine cleaning with cold solvents is less harmful to wiring than high-pressure steam cleaning.

c—Hot painting is quite satisfactory and that its acceptance is increasing among bus maintenance men.

On the other hand there was wide disagreement as to what is the proper proportion of spare buses to maintain. From those who quoted figures, the range was from four to 20 per cent.

The same widespread variation was revealed in the question "What is the minimum stock inventory per bus which must be maintained for greatest efficiency." A dozen companies gave a dozen different answers to this question.

It should be pointed out that the inventory per bus varied in accordance with the number of makes and models in the fleet as well as the distance from the source of supply. The high figure of $1,100 was supplied by an operator with seven different makes and eleven different models.

Small Operations Conference • The Small Operations Conference on the afternon of the closing day was presided over by Leonard Nussbaum, vice president Amarillo Bus Co., with opening remarks by Paul S. Peck, Vice president and general manager, Nueces Transportation Co., Corpus Christi, Texas.

This discussion centered around current fare trends and fare collection methods; reaction of public to drastic reductions or complete elimination of Sunday or night service; experience with promotional fares. There also was a discussion of the experiences with push-type doors from standpoint of passenger reaction, maintenance cost and accident prevention.

Passenger accidents also came in for discussion and such phases touched on as boarding, alighting and on board and claims policies.

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SIGNS that GO PLACES!

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"Ads on Wheels" Decal Truck Booklet . . . ask for it on company letterhead.

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Your trucks go where your customers are . . . that's why your best and most inexpensive advertising is on your own truck panels. MEYERCORD Decal Truck Signs, designed and produced to your specific requirements are always uniform, easy and quick to apply, have a long, useful life in every kind of weather. Get the full facts . . . write

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YOU GET MORE MILEAGE
FROM ML UNIFORMS

Greetings to our friends in the American Transit Association and the National Association of Motor Bus Operators. We hope that your West Coast sojourn will be a most pleasant one, and that you'll find time to visit Ott Lavaty, and Mori Kornreich, during Bus Convention, at the Mark Hopkins Hotel, in San Francisco.

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Raymond Loewy
IN HIS RECENT BOOK says:

"A nuisance that we have to guard against is defacement. One of humanity's strongest urges is the desire to engrave one's name on anything that can be dented, scratched, or embossed. Some go so far as to engrave (or tattoo) their names on their own skins.

In transportation it is a major problem. We have to protect bulk-heads, pier panels, toilet rooms, etc., from the urge of Joe to sketch a little fresco announcing to the world that he loves Julie. Or that the sitting position is favorable to the thinking process; or that So-and-So is a so-and-so, etc., etc. This calls for the use of certain non-defaceable materials."

(From "NEVER LEAVE WELL ENOUGH ALONE")
—Raymond Loewy

Pattern 5-BWL

• RIGID-TEX METALS are three-dimensional, design-strengthened and textured to conceal all dents, scratches, doodles and scuffs—a feature that reduces maintenance costs considerably in an unlimited variety of product applications. Other features: added rigidity; reduced gages for *metal conservation;* impact resistance; buckling strength; glare resistance; versatile fabrication.

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SEARCHLIGHT SECTION

(Classified Advertising)

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$10.00 per year, 12 issues—
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1953-51-48-47-44 Flxible 29-33-37 pass.
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1950 Beck 29 pass. rec. Silverside
1949 Beck Silverside 37 pass. air conditioned
1948-47-46 Beck 33 pass. rec.
1933 Beck 37 pass. non-rec.
1947 Fitzjohn Duraliner 28 pass. rec.
1946-45 Fitzjohn Falcon 35 pass. rec.
1946-45-44-41 Aerocoach 37 pass. rec.
1944 Pony Cruiser 25 pass.
1947 Ford 29 pass.
1946 Twin Coach 39 pass. Torque Conv.

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FS 1619, BUS TRANSPORTATION
330 West 42nd Street, New York 36, N. Y.

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4—96-HTD Reo Transit
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NO DEALERS

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1—1947 25 passenger CR Flxible
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36-70-09

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Both in excellent condition and priced for immediate sale.
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PRinceton 1-9813

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1—1947 Ford, 6 Cylinder, Transit
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HENDERSON, KY.

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PDA, 37 Pass., 471 Diesel, Recliners, Silverside.
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Model 69B
6 and 8
Cylinder
Ford Engines

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3 4506 1945 Very Good Condition

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3 PDA 3703 471 Engines. Good Condition
8 4103 1951 Air Con. Excellent Condition
6 4103 1952 Very Good Condition
4 4102 1950 Air Con. Very Good Condition
6 4103 1951 Air Con. Very Good Condition
10 4103 1953 Air Con. Very Good Condition

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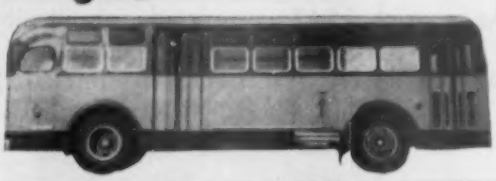

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20 TGM-4005 40 Pass. 529 Engine Excellent Condition, Good Trippers

3 1945-46 Flxibles, Buick Eng. 29 Passenger, Located in Minneapolis

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8 Model TDH-3610, 40 Pass. Transit Type. 4-71 Diesel

10 Model TDH-3610, 4-71 Diesel 36 Pass city type seats, completely rebuilt

1 1946 Beck, 450 Red Diamond Engine, 37 Pass.

5 3703 37 Pass. GMC 4 Cyl Diesel, Excellent Buy

10 4506 GMC Transit type Diesel, 45 Passenger. Excellent Condition

3 Model 733 coaches very clean

4 1946 PG-2904 GMC Coaches 3 with 29 Pass Reclining seats 1 with 31 Pass. Reclining Seats. Low mileage, excellent condition, priced $3,000.00 less tires.

10 TG-3609 GMC Gas City Type, 36 Pass.

10 PD3702-37 Pass, 4-71 Diesel, Reclining Seats, Silversides

4 PG-3702, 37 Pass. Silversides, New engines

2 1948 Fitzjohns Cityliners 33 Pass. double doors, Hercules Engine

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3—25 Pass. Flxibles, New 248 GMC Engines—recliners and isle seats

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1951 GMC PDA3704

2—37 Pass. GMC 471, Diesel Engines—Silver Sides—Air Conditioned—isle seats

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1—37 Pass. Aerocoach, International Engine—recliner seats

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1—11 Pass. Chevrolet Stretch Sedan. New Chev. Engine

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SEARCHLIGHT SECTION
(Classified Advertising)
H. E. Hilty, Mgr.

★

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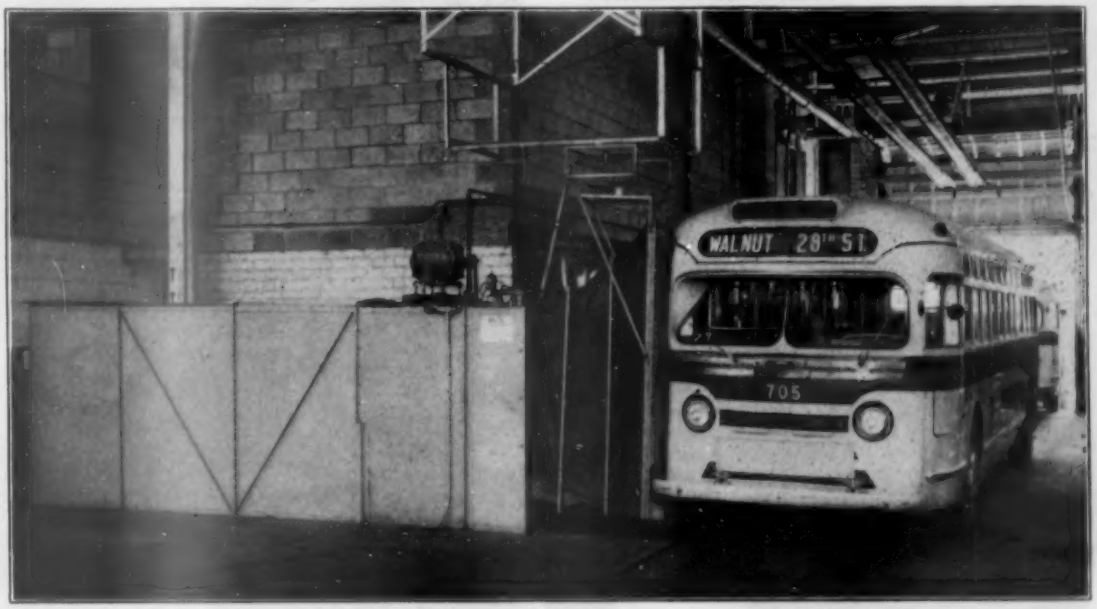
FOR REMOVING "TRASH" FROM TRANSIT BUSES

PATENTS PENDING



For the first time in bus history it is now possible for one man to thoroughly clean the inside of buses in *two to three minutes* regardless of the accumulation of dust, dirt, paper or rubbish.

Don't spend *ten to twelve minutes* doing a mediocre job when a *superior* one can be done in

3 MINUTES!

23 IN SERVICE

Reported Labor Savings:

$14,000 per year, one location

$9,600 per year another

$6,075 per year in Canada

Is 60c of your $1.00 spent for LABOR?

MANUFACTURED EXCLUSIVELY BY

ROSS AND WHITE COMPANY.

ASK FOR BULLETIN NO. 92 AND PRICE

CHICAGO DAILY NEWS BUILDING, CHICAGO 6, ILLINOIS

CLYDE P. ROSS, *President* • **DAVID E. WHITE, *Vice-President*** • **CARLETON P. ROSS, *Vice-President***
R. W. BURRILL, *Contracting Engineer*

JOHNSON TYPE "J" and TOKENS

...Give You FARE Collection Instead of Money Collection

The Johnson Type "J" is still today's smallest and lightest-weight automatic electric fare box. It's lowest in cost, too. Dimensions: 15½" high, 7" wide, 5" deep. Weight 19 pounds, 2 ounces.

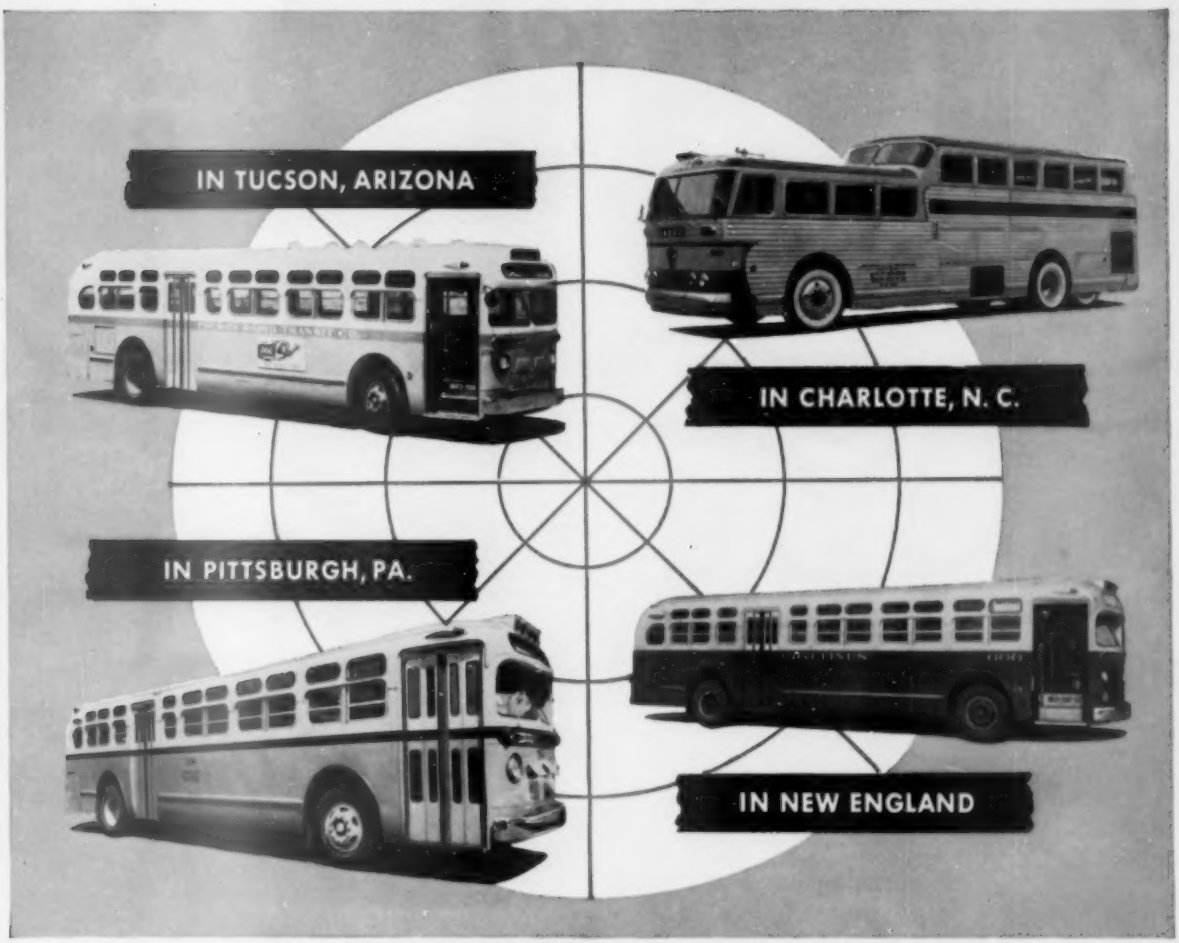
The combination of the Johnson Type "J" Automatic Electric Fare Box and Johnson metal fare tokens offers the simple solution to today's complex fare structures. With tokens, you have the practical answer to those hard-to-collect multi-coin fares plus an unlimited range of fare adjustments. With the Johnson Type "J," you have efficient collection with complete revenue protection. Every fare is automatically registered and classified. The token or coin does all the work. To speed up schedules with safety and safeguard your revenues, get full details on this dependable Johnson system, proven in service since 1923.

Johnson

Johnson Fare Box Company
Subsidiary of Bowser, Inc.

4619 North Ravenswood Ave., Chicago 40, Illinois
New York Office: 420 Lexington Ave., New York 17, N. Y.
Boston Office: 35 Leon Street, Boston, Mass.

JOHNSON IS ALSO PROTECTING BILLIONS IN U.S. BOMBER INVESTMENTS WITH PRECISION ARMAMENT EQUIPMENT



Performance Records prove the *EXTRA VALUE* of

Willard BUS BATTERIES

Throughout the United States, actual fleet maintenance records provide convincing evidence that Willard Bus Batteries cost less per mile . . . cost less per year . . . whatever the type of service involved.

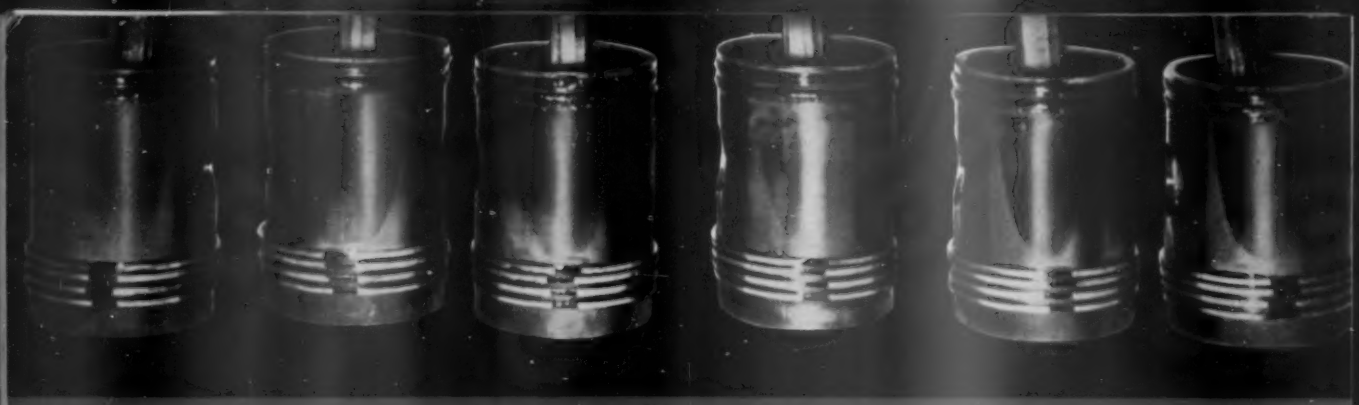
There are good sound reasons why famous Willard Bus Batteries last longer than ordinary batteries. Take the plates in the Willard BRG-4B-105, for example. They are three times as thick as those found in ordinary bus batteries. And they provide double-barreled economy; not only do they stand up better against shock and vibration; they also permit a lower setting of the voltage regulator, thereby extending battery life and lamp life, too. Another Willard *exclusive*—Safety-Fill construction—positively prevents overfilling . . . eliminates acid spray and dangerous corrosion.

NOW is the time to get the complete facts about Willard Bus Batteries. We will be glad to have one of our battery engineers call and discuss *your* specific requirements. Just let us know when you would like him to call.

Through Service we Grow

WILLARD STORAGE BATTERY COMPANY

FACTORIES IN: CLEVELAND • LOS ANGELES • DALLAS • MEMPHIS • PORTLAND • ALLENTOWN • TORONTO



Over 100,000 tough miles on these engine parts!

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil

The engine parts shown here come from a diesel bus unit which operated in severe start-stop service for well over 100,000 miles without overhaul. All parts are clean, pistons and valves showing only slight discolorations. Rings are free. Valves are in excellent condition with no signs of leakage. Connecting rod bearing clearances are well within manufacturer's operating tolerances, and bearings are to be reinstalled for further service.

Superior lubrication by STANOLUBE HD-M and an effective preventive maintenance program have kept maintenance costs at a minimum for this midwest fleet of 117 bus units. Connecting rod and main bearing life for both diesel and gasoline powered units has averaged 250,000 miles. Individual units, on the average, have gone well over 100,000 miles before requiring any overhaul work.

The Standard Oil automotive lubrication specialist serving your area can help you make savings through the use of STANOLUBE HD-M. Phone your local Standard Oil office. Or write: Standard Oil Company (Ind.), 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD *(Indiana)*